UNIV. OF
TORONTO
LIBRARY

BINDING LIST MA [illegible]

Archives of Pediatrics

A Monthly Journal Devoted to the

Diseases of Infants and Children

Founded in 1884 by Wm. Perry Watson, M.D.

EDITED BY

HAROLD RUCKMAN MIXSELL, A.B., M.D.
Attending Physician to the Willard Parker Hospital; Attending Pediatrist, New York Skin and Cancer Hospital; Assistant Attending Physician to the New York Nursery and Child's Hospital; Attending Physician to the New York Nursery and Child's Hospital, Out-Patient Department; Instructor in Pediatrics, Bellevue Medical School; Fellow of the New York Academy of Medicine, New York City.

VOLUME XXXIX
JANUARY TO DECEMBER
1922

210992
4:4:27

E. B. TREAT & CO., Publishers
45 East Seventeenth Street
NEW YORK

RJ
1
A5
1.39

LIST OF CONTRIBUTORS

Appel, Hermann N.
Barenberg, Louis H.
Bartley, E. H.
Bauer, Edward L.
Birchett, Jr., J. A. K.
Bloom, Otto I.
Brown, Alan
Bruce, James W.
Burr, Charles W.
Carr, Walter Lester
Clarke, Floyd
Clay, Homer T.
Colburn, W. O.
Courtney, A. M.
Davis, Clara M.
DeBuys, L. R.
Dembo, Leon H.
Denzer, Bernard S.
DeSanctis, Adolph G.
Donnelly, William Henry
Dow, Andrew G.
Faber, Harold K.
Farr, Charles E.
Field, Manning S.
Foster, Nellis Barnes
Freeman, Rowland G.
Gill, A. Bruce
Glover, S. G.
Golann, Daniel L.
Goodman, A. L.
Goodman, Herman
Griffith, J. P. Crozer
Herrman, Charles
Hill, Oliver W.
Horwitt, S.
Irving, George R.
Kerley, Charles G.
Kerley, James Hoyt
Klein, Sidney
Knox, Jr., J. H. Mason
Kopetzky, Samuel J.
Koplik, Henry
LeBoutillier, Theodore
Lemere, H. B.
Levinson, A.
Levy, William V.
Litchfield, H. R.
Lohnes, Harry R.
Love, James D.
Lustberg, Sam R.
MacLachlan, I. F.
Manning, G. Randolph
Mason, F. R.
Mikelberg, Henry B.
Miller, D. J. Milton
Mitchell, A. Graeme
Mitchell, Edward Clay
Mixsell, Harold R.
Moser, James M.
Mulherin, W. A.
Neff, Frank C.
Norris, Charles C.
Palmer, Dudley W.
Parounagian, Mihran B.
Pollitzer, R. M.
Putnam, James J.
Reuben, Mark S.
Richardson, Frank Howard
Rogers, Alfred Paul
Rosenberg, Philip
Rosenson, William
Rost, William L.
Rugh, J. Torrance
Sauer, L. W.
Schwartz, Alfred A.
Shaw, Henry L. K.
Shea, John J.
Sherman, DeWitt H.
Siegel, Alvin E.
Smith, Alonzo DeG.
Southworth, Thomas S.
Steffen, Walter C. S.
Stimson, Philip Moen
Strong, Robert A.
Talbot, Fritz B.
Tisdall, F. D.
Vander Bogert, Frank
Vipond, Albert E.
von Hofe, Frederick H.
Ward, J. Francis
Weston, William
Willard, DeForest P.
Williams, Frank
Williams, Tom A.
Young, Frank W.
Zamkin, Harry O.

Copyright, 1922.

By E. B. Treat & Co.
New York

INDEX TO VOLUME XXXIX

Page
Acetonemia in children 461
Acid intoxication due to food poisoning. LeBoutillier 308
Acidosis, alkalis in. Clarke and Dow 449
Acidosis, a study of, due to ketone acids 414
Acrocephaly. Young 629
Acrodynia (?) Davis 611
Acrodynia and its probable causation. Vipond 699
Acrodynia in infants 625
Acute infectious and contagious diseases, the rôle of, in childhood in the etiology of cardiovascular disease in the adult. Siegel 314
Addison's disease in early infancy 626
Adenoids, cause of 663
Adenoids in nurslings 22
Adenopathies, tracheobronchial, and infections of the respiratory tract 200
American Pediatric Society, detailed report of the thirty-fourth annual meeting, with full abstracts of all papers read 349
Anemia, aplastic, with a report of a case in a child four years old markedly improved by transfusion 388
Anemia, secondary, associated with an enlarged spleen, with report of a case in an infant twenty-months old. Herrman 465
Aortitis in a child 606
Appel, Hermann N., and Bloom, Otto I. Whooping-cough and its treatment 145
Asthma, treatment of, and associated diseases in children 627
Bacillus coli infection of urine 573
Barenberg, Louis H., and Rosenberg, Philip. Incidence of the Wassermann reaction in a large child-caring institution 23
Bartley, E. H. An easy and rapid method of preparing protein-milk 741
Bauer, Edward L. Suppurative nephritis in children 329
Birchett, Jr., J. A. K., and Lustberg, Sam R. The breast fed pellagrin; relations to the avitaminoses 255
Blood diseases, severe, of childhood 623
Blood in breast milk 370
Bloom, Otto I., and Appel, Hermann N. Whooping-cough and its treatment 145
Book reviews 483, 766
Brain tumors in young children, a clinical and pathological study of 386
Breast milk, anaphylaxis to 121
Breast milk, the rate of secretion of 371
Bronchial asthma, treatment of, with autogenous defibrinated blood 198
Bronchopneumonia, follow-up records of a series of patients with 358
Brown, Alan, Courtney, A. M., Tisdall, F. D., and MacLachlan, I. F. A critical study of two cases of rickets developing in breast fed infants 559
Bruce, James W. Observations on the effect of complementary feedings of dry milk powder on the initial weight loss in the newborn 656
Burr, Charles W. The relation of infantile convulsions to epilepsy 303

Cardiac disease, potential, and the prevention of organic heart disease in children 345
Cardiac disease, some phases of, in childhood.......... 628
Calcification of bone, factors concerned in the.......... 400
Carr, Walter Lester. A clinical report of simple methods in the care of premature babies.......... 436
Carr, Walter Lester. A group of difficult feeding cases from the pediatric division, City Hospital.......... 715
Carr, Walter Lester. An appreciation of Joseph E. Winters.......... 743
Carr, Walter Lester. When shall the membrana tympani be incised, and when is re-incision indicated.......... 91
Case reports. Hill.......... 271
Celiac disease 376
Cerebro-cerebellar diplegia—atonic type.......... 411
Cerebrospinal fluid, a comparative study of several tests for the quantitative determination of the reducing substance in. Strong 431
Cholecystitis and cholelithiasis in children. Farr.......... 574
Chorea 430
Chorea, the late treatment of, as a problem of convalescence. Irving.. 159
Chronic nasopharyngeal infection, chronic toxemia, and distressed heart in children 688
Clarke, Floyd, and Dow, Andrew G. Alkalis in acidosis.......... 449
Clay, Homer T. Mongolian idiocy occurring in one of twins.......... 726
Colburn, W. O. Diabetes mellitus in a child of 22 months.......... 48
Complementary feeding of dry milk powder, observations on the effect of, on the initial weight loss in the new-born. Bruce.......... 656
Congenital hypertrophy, persistent, of the right lower extremity. Lustberg. 662
Convulsions and mild or pseudo-petit-mal, report of a case of, in a boy due to genital irritation 393
Convulsions in childhood.......... 694
Convulsions in children, treatment of.......... 655
Coryza in infancy and childhood.......... 343
Courtney, A. M., Tisdall, F. D., MacLachlan, I. F., and Brown, Alan. A critical study of two cases of rickets developing in breast fed infants 559
Cyanosis, congenital, and heart disease, congenital, without murmurs. Reuben and Steffen.......... 811
Davis, Clara M. Acrodynia (?).......... 611
DeBuys, L. R. Management of the newly-born service.......... 205
Decerebrate rigidity, a case of.......... 103
Dehydration, treatment of, in infants.......... 694
Dembo, Leon H. A portable incubator.......... 269
Dembo, Leon H., and Litchfield, H. R. Parenteral infection in infants; its relation to digestive and metabolic disturbances. Report of illustrative cases 641
Dento-facial maldevelopments and their correction.......... 137
Denzer, Bernard S. The diagnosis of peritonitis and peritoneal transudates by means of abdominal puncture with capillary tube 720
DeSanctis, Adolph G. Egg yolk in infant feeding.......... 104
D'Espines and allied signs in childhood.......... 355
Diabetes mellitus in a child of 22 months. Colburn.......... 48

Diabetes mellitus, the management of, in children.................... 692
Diabetes insipidus, immediate recovery from, after lumbar puncture.. 554
Diagnosis, a case for. Mixsell.................................. 51
Diagnostic points, a few specific, in the treatment of children. Glover.. 99
Diarrhea, infectious, in young children.......................... 341
Dietetics, applied, in out-patient departments....................... 349
Difficult feeding cases, a group of, from the pediatric division, City Hospital. Carr 715
Digitalis, the tolerance of children for............................... 551
Diphtheria, abnormal forms of.. 258
Diphtheria antitoxin, the dosage of; an analysis of the records of the South Department, Boston 404
Diphtheria, fatal, in a baby one month old with a negative Schick test 197
Diphtheritic and postdiphtheritic paralysis........................ 339
Diphtheritic exudate, removal of, from the larynx.................. 346
Diphtheria, gangrene of the feet following......................... 204
Diuresis in childhood, pituitary extract in.......................... 697
Dow, Andrew G., and Clarke, Floyd. Alkalis in acidosis.............. 449
Duodenum, foreign bodies in the...................................... 600
Duration of stay of food in infant stomach......................... 85
Ear infections, acute middle, in children.......................... 348
Eczema, dietary consideration of, in younger children.................. 341
Edema from undernourishment in young children.................. 144
Emotions, the treatment of the, in young people. Williams.......... 180
Encephalitis, lethargic 333
Encephalitis, acute, three cases of, treated with specific serum.......... 368
Endocarditis, rheumatismal aortic, in children........................ 106
Enuresis, diagnosis and treatment of nocturnal and diurnal............ 698
Epilepsy, the relation of infantile convulsions to. Burr................ 303
Epituberculous inflation of child lung............................... 830
Eruptive disease, a peculiar, occurring in infancy..................... 690
Erythroedema, a case of. Field.. 116
Esophagus, congenital atresia of the. Steffen......................... 823
Exanthem, an unusual, occurring in infants........................... 202
Exfoliative dermatitis with fatal termination following tonsillectomy. Kerley 462
Faber, Harold K. An improved weight chart for infants in first year.. 545
Familial hyperexcitability of the brain................................ 448
Farr, Charles E. Cholecystitis and cholelithiasis in children.......... 574
Feeding, indications and technic of, with protein milk................ 343
Feeding problems, some Southern. Weston.......................... 222
Feeding sick children.. 347
Feet, the care of the, during childhood.............................. 693
Fever, an analysis of the cause of, in early life with a view to diagnosis 695
Field, Manning S. A case of erythroedema............................ 116
Food, concentrated, for infants...................................... 169
Food proteins, anaphylaxis to, in breast fed infants.................. 340
Foster, Nellis Barnes. A Puritan practitioner........................ 593
Freeman, Rowland G. Prognosis and treatment of tuberculosis in infancy and childhood... 489
Gastroenteritis in infancy, acute, treatment of....................... 326
Gastrointestinal tract in children, the symptomatology of structural abnormalities of the. Kerley.................................. 512

Gill, A. Bruce. End results of the Stoffel operation in cases of spastic paralysis 320
Glover, S. G. A few specific diagnostic points in the treatment of children 99
Glover, S. G. Retroperitoneal sarcoma in children with report of a case 485
Goitre in children. Klein........ 786
Golann, Daniel L. Cerebral spastic paralysis, with special references to Little's disease 705
Gonococcal infection, the treament of, in the lower genital tract of female infants and young girls. Norris and Mikelberg........ 281
Goodman, A. L. Social service in the cure and prevention of heart disease 530
Goodman, Herman, and Parounagian, Mihran B. Acquired syphilis by genital chancre in male children, with report of a case in a boy 5½ years 651
Griffith, J. P. Crozer. A case of xanthoma tuberosum, with early jaundice and with diabetes insipidus........ 297
Health center, what a, may mean to a community. Knox........ 170
Heart block in infancy and childhood, with report of a case. Rosenson 567
Heart action in spasmophilia. Koplik........ 504
Heart disease, congenital, a case of dwarfism with. Herrman........ 45
Heart disease, social service in the cure and prevention of. Goodman 530
Hemiplegia, infantile cerebral, with hemianopsia........ 689
Hemorrhages, traumatic intracranial, in the new-born........ 344
Hemorrhage, intracranial, in the new-born........ 624
Herrman, Charles. A case of dwarfism with congenital heart disease.. 45
Herrman, Charles. Immunization against measles........ 607
Herrman, Charles. Secondary anemia associated with an enlarged spleen, with report of a case in an infant twenty months old.... 465
Hill, Oliver W. Case reports........ 27
Hip-joint disease in childhood, the diagnosis and differential diagnosis of early. Rugh........ 323
Horwitt, S. Leukemia, acute myeloblastic........ 819
Hydrocephalus, chronic, in children........ 529
Hydrocephalus, medical treatment of........ 199
Hydrogen ion concentration of the grastric contents........ 361
Hyperthyroidism with marked toxic symptoms due to congential lues. Rost 458
Incontinence, false, of the sphincters in children........ 714
Incubator, a portable. Dembo........ 269
Infant feeding, details in. Moser........ 442
Infant feeding, egg yolk in. DeSanctis........ 104
Infection, bacillus coli, of the urinary tract in infants........ 337
Infection, parenteral, in infants; its relation to digestive and metabolic disturbances. Report of illustrative cases. Litchfield and Dembo 641
Inoculation of the human throat, experimental, with virulent diphtheria bacilli 198
Intestinal flora in infants, a practical consideration of the. Sherman and Lohnes 37
Intestinal neuroses in infants........ 503
Intracranial hemorrhage of the new-born, lumbar puncture in the treatment of 199

Intraperitoneal injections in infancy. Mitchell........................ 291
Intraperitoneal injections of salt solution, value of.................. 204
Intravenous injection of salicylate of soda in the infant.............. 627
Intussusception, acute 555
Intussusception, chronic 454
Irving, George R. The late treatment of chorea as a problem of convalescence. 159
Jaundice, chronic hemolytic. Levy...................................... 827
Jaundice in the new-born... 547
Jaundice in the new-born... 441
Kerley, Charles G. The symptomatology of structural abnormalities of the gastrointestinal tract in children........................ 512
Kerley, James Hoyt. Exfoliative dermatitis with fatal termination following tonsillectomy 462
Klein, Sidney. Goitre in children...................................... 786
Knox, Jr., J. H. Mason. What a health center may mean to a community 170
Kopetzky, Samuel J., and Schwartz, Alfred A. Limitations of the reincision of the tympanic membrane.................................. 86
Koplik, Henry. The heart action in spasmophilia....................... 504
Lead poisoning in children... 581
LeBoutillier, Theodore. Acid intoxication due to food poisoning...... 308
Lemere, H. B. The diagnosis of nasal sinus disease in children........ 601
Leukemia, acute myeloblastic. Horwitt.................................. 819
Leukemia and severe anemia in childhood................................ 558
Levinson, A. Charles D. Meigs: a note on the history of infant feeding 664
Levy, William V. Jaundice, chronic hemolytic........................... 827
Lipodystrophia progressiva, cases of. Reuben and Zamkin................ 112
Litchfield, H. R., and Dembo, Leon H. Parenteral infection in infants: its relation to digestive and metabolic disturbances. Report of illustrative cases 641
Litchfield, H. R., and Mason, F. R. Still's disease (atrophic arthritis).. 107
Lohnes, Harry R., and Sherman, DeWitt H. A practical consideration of the intestinal flora in infants............................... 37
Love, James D. Medication in infancy and childhood..................... 259
Lucilia, the ubiquitous paralysis-fly and its ally, the buzzard........ 392
Lustberg, Sam R., and Birchett, Jr., J. A. K. The breast fed pellagrin; relations to the avitaminoses.................................. 255
Lustberg, Sam R. Persistent congenital hypertrophy of the right lower extremity 662
MacLachlan, I. F., Brown, Alan, Courtney, A. M., Tisdall, F. D. A critical study of two cases of rickets developing in breast fed infants 559
Manning, G. Randolph, and Reuben, Mark S. Precocious puberty.......... 769
Mason, F. R., and Litchfield, H. R. Still's disease (atrophic arthritis).. 107
Mastoditis, observations on acute....................................... 557
Measles, certain aspects of. Stimson.................................... 11
Measles, gangrene following... 211
Measles, immunization against. Herrman.................................. 607
Measles, purpura fulminans following.................................... 623
Medication in infancy and childhood. Love............................... 259
Meigs, Charles D. A note on the history of infant feeding. Levinson 664

Melena in the new-born 158
Membrana tympani, when shall it be incised, and when is re-incision indicated. Carr 91
Meningitis, meningococcus 229
Meningitis, purulent, a peculiar case of, in the new-born 396
Meningitis, tuberculous, the binda sign of 90
Meningitis, tuberculous, and inherited syphilis 249
Metabolism, basal, clinical value of, in infancy and childhood. Talbot 419
Milk, acid, in infant feeding 364
Milk, acid, in infant feeding. Shaw and Williams 516
Milk, collection and preservation of human 342
Milk, dried 551
Milk, dry, as a food in infancy 627
Milk, dry, in the feeding of well and sick babies 345
Milk, powdered protein, as a prophylactic food for young infants. Sauer 1
Milk, treatment of intolerance of mother's, by its injection subcutaneously 340
Mikelberg, Henry B., and Norris, Charles C. The treatment of gonococcal infection in the lower genital tract of female infants and young girls 281
Miller, D. J. Milton. Some of the vagaries of the symptomatology of pyelitis 618
Mitchell, A. Graeme. Intraperitoneal injections in infancy 291
Mitchell, Edward Clay, and Shea, John J. Nasal sinus disease in children 230
Mixsell, Harold R. A case for diagnosis 51
Mongolian idiocy 70
Mongolian idiocy, a report of 150 cases of. von Hofe 737
Mongolian idiocy occurring in one of twins. Clay 726
Moser, James M. Details in infant feeding 442
Mulherin, W. A. The Southern baby 212
Mumps, new treatment for 555
Nasal sinus disease in children. Mitchell and Shea 230
Nasal sinus disease, the diagnosis of, in children. Lemere 601
Neff, Frank C. Scarlet fever immunization 250
Neosalvarsan, treatment of Vincent's agina with 344
Nephritis, chronic, decapsulation of kidney in 290
Nephritis in children 549
Nephritis, suppurative, in children. Bauer 329
New-born child, the 704
Newly-born service, management of the. DeBuys 205
New York Academy of Medicine—Section on Medicine 746
New York Academy of Medicine—Section on Pediatrics, 54, 122, 186, 471, 666
Nitrogen metabolism, the, in some conditions of constitutional diathesis 413
Norris, Charles C., and Mikelberg, Henry B. The treatment of gonococcal infection in the lower genital tract of female infants and young girls 281
Nursing and feeding, a critical consideration of the four hour interval. Southworth 94
Nutritional diseases and disorders, our changing attitude toward the.

Weston 525
Ocular defects, the prevention of, in school children 695
Ophthalmoscopic examination, importance of, in children 342
Osteomyelitis, acute, of the ribs 221
Otitis media 347
Otitis media, the use of radiant heat-light in the treatment of 698
Palmer, Dudley W. Congenital hyperplastic pyloric stenosis 582
Paralysis, cerebral spastic, with special references to Little's disease. Golann 705
Parounagian, Mihran B., and Goodman, Herman. Acquired syphilis by genital chancre in male children, with report of a case in a boy 5½ years 651
Pediatrics, everyday. Pollitzer 243
Pediatric seminar, the Southern. Richardson 264
Pellagrin, the breast fed: relations to the avitaminoses. Lustberg and Birchett, Jr. 255
Pericarditic pseudopneumonia in children 337
Peritonitis and peritoneal transudates, the diagnosis of, by means of abdominal puncture with capillary tube. Denzer 720
Peritonitis, treatment of subacute or chronic tuberculous, in the child 552
Pertussis, ether treatment of 697
Pertussis vaccine, prophylactic and therapeutic value of 550
Phlebitis, acute, in children 544
Philadelphia Pediatric Society 64, 679, 681, 758
Physiology of early life, importance of a study of the 556
Pirquet school, feeding method of the 336
Pirquet tests, data in 3472 624
Pneumonia and postpneumonia empyema in infants and children, bacteriologic studies of 165 cases of 203
Pneumonia, cerebral reactions in 179
Pneumonia neonatorum 725
Pollitzer, R. M. Everyday pediatrics 243
Practitioner, a Puritan. Foster 593
Precocious puberty. Reuben and Manning 769
Premature babies, a clinical report of simple methods in the care of. Carr 436
Prematurity, the basal metabolism of 374
Prophylaxis of arthritism in children 810
Protein-milk, an easy and rapid method of preparing. Bartley 741
Protein sensitization tests, the value of, employed in eczema and urticiaria of childhood 548
Protein sensitization, the common factor in whooping-cough, asthma, hay fever, and influenza. Ward 730
Pseudocyst in the radius 822
Pulmonary tuberculosis in children, the "spleno-pneumonic" in 353
Putnam, James J. The ideal weight of children 71
Pyelitis, some of the vagaries of the symptomatology of. Miller 618
Pyloric stenosis, congenital hypertrophic 270
Pylorospasm, treatment of, in infants 346
Pylorus, stenosis of the, in infants 185
Pylorus, stenosis of the, in infants 263

Reuben, Mark S., and Steffen, Walter C. A. Congential cyanosis and congenital heart disease, without murmurs............ 811
Reuben, Mark S., and Manning, G. Randolph. Precocious puberty..... 769
Reuben, Mark S., and Zamkin, Harry O. Cases of lipodystrophia progressiva 112
Rheumatism and its manifestations in children under five years. Smith 799
Richardson, Frank Howard. The Southern pediatric seminar........ 264
Rickets 622
Rickets, a critical study of two cases of, developing in breast fed infants. Brown, Courtney, Tisdall and MacLachlan.................... 559
Rickets, etiology of.. 515
Rickets, is there more than one kind of............................ 203
Rickets the significance of clinical, radiographic and chemical changes in the early diagnosis of.. 400
Rickets, ultra-violet radiation in.................................. 624
Rickets, use of the carbon arc light in the prevention and cure of...... 550
Roentgen ray and tuberculosis in infants and children................ 693
Rogers, Alfred Paul. Dento-facial maldevelopments and their correction 137
Rosenberg, Philip, and Barenberg, Louis H. Incidence of the Wassermann reaction in a large child-caring institution................. 23
Rosenson, William. Heart block in infancy and childhood, with report of a case... 567
Rost, William L. Hyperthyroidism with marked toxic symptoms due to congenital lues.. 458
Rugh, J. Torrance. The diagnosis and differential diagnosis of early hip-joint disease in childhood..................................... 323
Rumination in infants.. 242
Sarcoma, retroperitoneal, in children, with report of a case. Glover.... 485
Sauer, L. W. Powdered protein-milk as a prophylactic food for young infants. 1
Scarlet fever immunization. Neff.................................... 250
Schwartz, Alfred A., and Kopetzky, Samuel J. Limitation of the reincision of the tympanic membrane.................................. 86
Sella turcica, the size of the, in relation to body measurements........ 408
Sella turcica, roentgenographic study of the, in normal children...... 338
Serotherapy of purpura... 511
Shaw, Henry L. K., and Williams, Frank. Acid milk in infant feeding 516
Shea, John J., and Mitchell, Edward Clay. Nasal sinus disease in children 230
Sherman, DeWitt H., and Lohnes, Harry R. A practical consideration of the intestinal flora in infants................................ 37
Siegel, Alvin E. The role of acute infectious and contagious diseases in childhood in the etiology of cardiovascular disease in the adult 314
Sleeplessness in infants.. 623
Smith, Alonzo DeG. Rheumatism and its manifestations in children under five years... 799
Southern baby, the. Mulherin.. 212
Southworth, Thomas S. A critical consideration of the four hour nursing and feeding interval..................................... 94
Spasmophilia 622

Spasmophilia 719
Spasmophilia, etiology and pathogenesis of......................... 694
Spastic paralysis, end results of the Stoffel operation in cases of. Gill 320
Spleen, indications for the removal of the, in infants and children...... 549
Steffen, Walter C. A., and Reuben, Mark S. Congential cyanosis and congenital heart disease, without murmurs............ 811
Steffen, Walter C. A. Esophagus, congenital atresia of the.......... 823
Stenosis, congenital hyperplastic pyloric. Palmer.................... 582
Stenosis, healing of hypertrophic pyloric, after the Fredet-Rammstedt operation 690
Still's disease (atrophic arthritis). Litchfield and Mason............. 107
Stimson, Philip Moen. Certain aspects of measles.................. 11
Stridor in young children.. 93
Strong, Robert A. A comparative study of several tests for the quantitative determination of the reducing substance in cerebrospinal fluid 431
Syphilis, a study of 443 cases of hereditary, with especial reference to results of treatment.. 689
Syphilis, acquired, by genital chancre in male children, with report of a case in a boy of 5½ years. Parounagian and Goodman......... 651
Syphilis, frequency of, in infants with habitual vomiting.............. 199
Syphilis, the treatment of antenatal and congenital.................. 201
Talbot, Fritz B. Clinical value of basal metabolism in infancy and childhood 419
Temperature, reduction of, in children without the aid of drugs........ 335
Thorax of the newly-born, a study of the shadows in the............. 410
Tisdall, F. D., MacLachlan, I. F., Brown, Alan, and Courtney, A. M. A critical study of two cases of rickets developing in breast fed infants 559
Tonsillectomy, effect of, on twelve hundred children................. 334
Tonsillectomy, indications for, in infancy and childhood.............. 381
Tonsillectomy in the contagious diseases............................ 696
Tonsillectomy, precautions to be taken before....................... 552
Tracheo-bronchial adenopathy in children, a new sign in............. 691
Transmission of complement fixation substances from mother to child.. 548
Tuberculin skin reactions, negative, in respiratory diseases in children.. 344
Tuberculosis, bone and surgical, progress in. Willard................ 327
Tuberculosis, diagnosis of pulmonary, in children.................... 98
Tuberculosis, direct exposure to, in infancy and childhood and its relation to manifest pulmonary tuberculosis in the adult......... 691
Tuberculosis, heliotherapy in the treatment of....................... 556
Tuberculosis in childhood, the frequency of......................... 690
Tuberculosis in children, diagnosis of pulmonary.................... 536
Tuberculosis in children, essential findings in pulmonary.............. 692
Tuberculosis in children, observations on the diagnosis of active........ 557
Tuberculosis in infancy and childhood, prognosis and treatment of.... 403
Tuberculosis, juvenile 696
Tuberculosis, nutritional treatment of................................ 336
Tuberculosis of the spine, treatment of, in children................... 200
Tuberculosis, prognosis and treatment of, in infancy and childhood. Freeman 489

Tuberculous parents, the offspring of 625

Tumor, mediastinal, an unusual case of 398

Tumor, carcinoid, of Meckel's diverticulum 566

Tumor, primary malignant, of liver in infants 665

Tumors in children 592

Thymus death 488

Tympanic membrane, limitations of the re-incision of the. Kopetzky and Schwartz 86

Typhoid and paratyphoid bacilli, the presence of, in the cerebrospinal fluid 553

Undernourished child, rational management of the. Vander Bogert 537

Undernourishment, prevention and treatment of, in childhood 338

Urinary lithiasis in children 339

Urinary tract, acute infections of the, in infants and children subsiding without the appearance of pus in the urine 417

Urticiaria, severe, from lamb's wool mattress 554

Vander Bogert, Frank. Rational management of the undernourished child 537

Vipond, A. E. Acrodynia and its probable causation 699

Vitamine products, experimental studies with proprietary 379

Vomiting, explosive; pylorospasm; hypertrophic stenosis of the pylorus 197

Vomiting, habitual, in infants 44

Vomiting, habitual, in the nursling 626

Vomiting in infants and children 335

von Hofe, Frederick H. A report of 150 cases of Mongolian idiocy 737

Ward, J. Francis. Protein sensitization, the common factor in whooping-cough, asthma, hay fever, and influenza 730

Wassermann reaction, experimental study of, in children 435

Wassermann reaction, incidence of the, in a large child-caring institution. Barenberg and Rosenberg 23

Watery vapor, exhalation of, from the lungs of the normal infant and from the infant with diarrhea 554

Weight chart, an improved, for infants in the first year. Faber 545

Weight of children, the ideal. Putnam 71

Weston, William. Our changing attitude toward the nutritional diseases and disorders 525

Weston, William. Some Southern feeding problems 222

Whooping-cough 53

Whooping-cough and its treatment. Appel and Bloom 145

Willard, DeForest P. Progress in bone and surgical tuberculosis 327

Williams, Frank, and Shaw, Henry L. K. Acid milk in infant feeding 516

Williams, Tom A. The treatment of the emotions in young people 180

Winters, Joseph E. An appreciation 743

Xanthoma tuberosum, a case of, with early jaundice and with diabetes insipidus. Griffith 297

Xanthoma tuberosum with diabetes insipidus 395

Yeast: can it be used as a source of the antineuritic vitamin in infant feeding? 202

Young, Frank W. Acrocephaly 629

Zamkin, Harry O., and Reuben, Mark S. Cases of lipodystrophia progressiva 112

ARCHIVES OF PEDIATRICS

JANUARY, 1922

HAROLD RUCKMAN MIXSELL, A.B., M.D., Editor

COLLABORATORS:

L. Emmett Holt, M.D.	New York
W. P. Northrup, M.D.	New York
Henry D. Chapin, M.D.	New York
Francis Huber, M.D.	New York
Henry Koplik, M.D.	New York
Rowland G. Freeman, M.D.	New York
Walter Lester Carr, M.D.	New York
C. G. Kerley, M.D.	New York
L. E. La Fétra, M.D.	New York
Royal Storrs Haynes, M.D.	New York
Herbert B. Wilcox, M.D.	New York
Charles Herrman, M.D.	New York
William H. Donnelly	Brooklyn
Frank H. Richardson	Brooklyn
Edwin E. Graham, M.D.	Philadelphia
J. P. Crozer Griffith, M.D.	Philadelphia
J. C. Gittings, M.D.	Philadelphia
A. Graeme Mitchell, M.D.	Philadelphia
Charles A. Fife, M.D.	Philadelphia
H. C. Carpenter, M.D.	Philadelphia
I. A. Abt, M.D.	Chicago
William P. Lucas, M.D.	San Francisco
R. Langley Porter, M.D.	San Francisco
E. C. Fleischner, M.D.	San Francisco
Fritz B. Talbot, M.D.	Boston
Oscar M. Schloss, M.D.	Boston
Maynard Ladd, M.D.	Boston
Charles Hunter Dunn, M.D.	Boston
Henry I. Bowditch, M.D.	Boston
Richard M. Smith, M.D.	Boston
L. R. De Buys, M.D.	New Orleans
Robert A. Strong, M.D.	New Orleans
John Foote	Washington
Joseph S. Wall	Washington
B. K. Rachford, M.D.	Cincinnati
Henry J. Gerstenberger, M.D.	Cleveland
Borden S. Veeder, M.D.	St. Louis
Frederick W. Schlutz, M.D.	Minneapolis
Julius P. Sedgwick, M.D.	Minneapolis
William Weston, Jr., M.D.	Columbia, S. C.
A. D. Blackader, M.D.	Montreal
Edmund Cautley, M.D.	London
G. A. Sutherland, M.D.	London
J. D. Rolleston, M.D.	London
J. W. Ballantyne, M.D.	Edinburgh
James Carmichael, M.D.	Edinburgh
G. A. Wright, M.D.	Manchester

PUBLISHED MONTHLY BY E. B. TREAT & CO., 45 EAST 17TH STREET, NEW YORK.

ORIGINAL COMMUNICATIONS

POWDERED PROTEIN-MILK AS A PROPHYLACTIC FOOD FOR YOUNG INFANTS.*

By L. W. Sauer, M.D.

Evanston, Ill.

Only a little more than a decade has passed since L. F. Meyer[1] fed a group of infants cow's milk casein and mother's milk whey and found that they thrived, whereas another group, fed on cow's milk whey and mother's milk casein, were subject to the same intestinal disturbances encountered when ordinary milk mixtures were used. Soon after this epoch-making observation, Finkelstein[2] introduced eiweissmilch (also called protein-, albumin-, or casein-milk). Very much has been learned and written since 1910 about this most valuable therapeutic agent.

---

*From the Pediatric Department of the Evanston Hospital, Evanston, Ill.

While most all of the work done on protein-milk proves its great value as a food for infants with intestinal disturbances, very little has been said about protein-milk as a prophylactic or complemental food for young infants.[3] This is probably due to the fact that most of the carefully studied cases receiving protein-milk were sick infants in hospitals, and it was found difficult to make many of these infants gain in weight when fed eiweissmilch without much additional carbohydrate over long periods of time.[4] We now realize why the diarrhea improved, but the weight failed to increase. Finkelstein[5] says: "We have learned that relatively large amounts of carbohydrate may be added. One should begin with at least 3 per cent. additional carbohydrate,—for the past few years I begin with 5 per cent. additional carbohydrate. I increase the amount of food rapidly to 3 ounces per pound of body weight. Infants much underweight sometimes require more, but never does the maximum exceed a liter. If the weight fails to increase, the amount of carbohydrate is increased, even up to 10 per cent. He who uses protein-milk as above outlined will doubtless be pleased with his results, provided the protein-milk is well prepared. Failure is usually due to (1) giving insufficient protein-milk, whereby a generalized inanition ensues; (2) giving insufficient carbohydrate, causing the damage due to carbohydrate starvation."

Finkelstein's formula is practically as follows: to a quart of raw, whole milk in a double boiler at 105°, is added a tablespoonful of essence of pepsin. After thirty minutes, the curd is freed from the whey by suspending in a cheese-cloth bag (in a refrigerator). The drained curd is then rubbed (not pressed) 4 or 5 times through a fine sieve (36 wires to the inch), a pint of good buttermilk and sufficient water being used to make a quart. The whole is then boiled vigorously and constantly beaten in order to prevent clumping. He cautions that protein-milk containing coarse curds has very little value. Mixtures containing coarse particles may cause failure. The suspension must be so uniform that on shaking it must look like whole milk.

While the percentage of the constituents may vary somewhat, the composition of Finkelstein's eiweissmilch is approximately: Protein 3 per cent., fat 2.5 per cent., lactose 1.5 per cent., salts 4 per cent., water 92.6 per cent. The food value is about 11 calories to the ounce.

Protein-milk is essentially a mixture of cottage cheese and buttermilk. Due to the difficulty in its preparation, the instability of the finished product, and the variations in the fat content and acidity, numerous modifications have been suggested from time to time. Various curdling agents, skimmed milk in place of whole milk, not boiling the finished product, and numerous other suggestions have been offered by various advocates. In spite of all these modifications, the close attention and time required in its preparation, the instability and variable composition of the finished product, the ease with which it curdles when heated, and the difficulties encountered in feeding it (taste and curds) have undoubtedly retarded its universal adoption.

All of the essential difficulties above enumerated are now overcome, for there are at present a number of reliable protein- or albumin-milks on the market. Several of these are in powder form. If kept in a cool place, these powdered protein-milks will keep their remarkable properties for months. The only preparation necessary is adding warm (not hot) water and passing the mixture through a fine sieve. The addition of saccharin makes it quite palatable. Carbohydrate may be added as occasion demands. This food has, for most purposes, all of the qualities not only of the freshly prepared eiweissmilch, but also of lactic acid milk.

The large amounts of casein and lactic acid compared with the low concentration of carbohydrate and whey salts make protein-milk an unsuitable medium for the growth of those intestinal bacteria which are associated with infantile diarrhea. The dilution of the whey salts apparently increases the tolerance for sugar and fat, the increase in protein inhibits fermentation and retards intestinal peristalsis.

The author has used protein-milk since 1912 as a prophylactic food in the complemental feeding of premature and young infants. He has used powdered protein-milks since 1916 in several thousand normal infants under 10 pounds, over periods of weeks or months. In many of these cases it was used as an exclusive diet. The results are usually unique.* Vomiting, gas, colic and diarrhea, so common in young breast fed infants, are rare, and when present can frequently be attributed to over-feeding, excessive external heat, too much clothing, or improper feeding technic. When protein-milk is used as a complemental food, the 24-hour amount of breast milk should be determined from week to week, as wide variations occur.

---

*Holt and Falls[6] have recently pointed out that when cow's milk is substituted for woman's milk, the amount of protein allowed should be doubled or trebled.

The composition of the powdered protein-milk which we are now using in the hospital and in the home averages as follows: Protein 38 per cent., fat 27 per cent., lactose 24 per cent., ash 5 per cent., free lactic acid 3 per cent., and moisture 3 per cent. The food value is about 150 calories to the ounce. (3½ level, packed tablespoonfuls of the powder weigh one ounce.) When one part by weight of the powder is added to 11 parts of water, the composition is approximately: Protein 3.16 per cent., fat 2.25 per cent., lactose 2 per cent., ash .42 per cent., free lactic acid .25 per cent., and water 91.92 per cent. The food value is about 11 calories to the ounce. These figures approximate those of Finkelstein's eiweissmilch.

The standard concentration is prepared by the addition of 3 ounces (10½ level, packed tablespoonfuls) to a quart of water. The addition of 1⅓ level tablespoonfuls of dextri-maltose increases the carbohydrate approximately one per cent. We usually begin with 3 per cent. and increase as occasion demands. An important advantage of the powdered protein-milk is the ease with which the food can be concentrated or diluted. In some instances, especially in vomiting infants above 9 pounds, we have used the food more concentrated than the standard strength mentioned above.

PROCEDURE

When the physical, blood, urine, and other examinations of a non-thriving breast fed infant under 10 pounds reveal nothing abnormal, weighings before and after each nursing are instituted for 2 successive days. If the total for 24 hours is found to be deficient, enough of a protein-milk mixture is given after any or all nursings to total the amount required to accomplish a satisfactory weekly gain in weight. The tolerance of these very young infants for protein-milk is so great that vomiting, colic, and diarrhea seldom occur. (See weight charts.)

When the normal infant's weight reaches 10 pounds, usually

2 or more feedings of an ordinary cow's milk mixture (suitable for the age and weight) are substituted for an equal number of powdered protein-milk feedings. This transition period usually

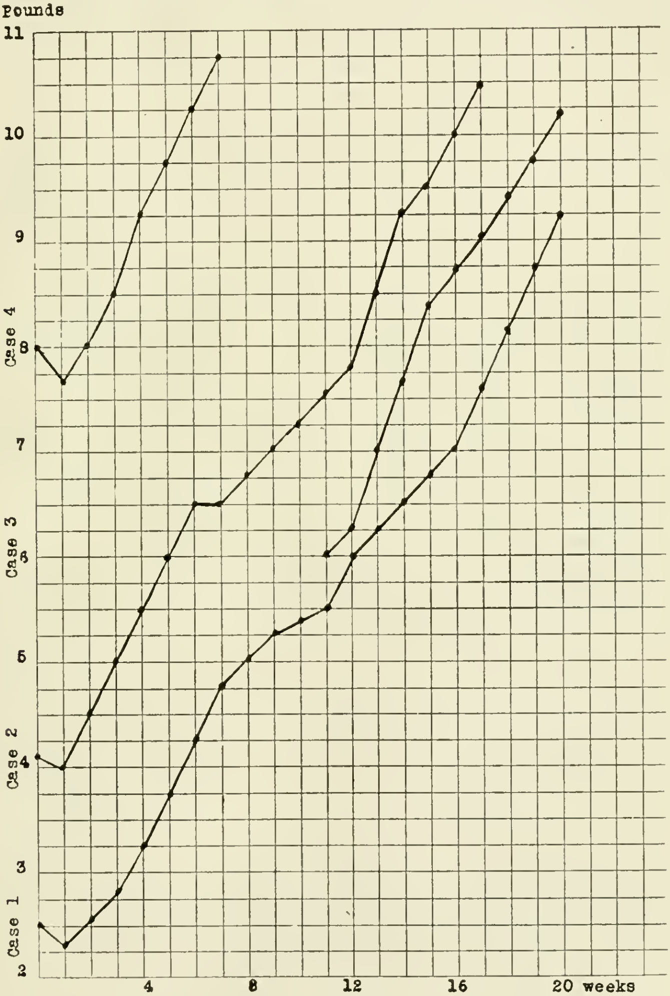


Fig. 1. Weight charts of Four Infants Fed on Powdered Protein-Milk.

covers a week, or until the home supply of powdered protein-milk is consumed. Then the entire complemental food is made up of a suitable cow's milk mixture. The week when this change in diet takes place, skimmed cow's milk is usually used and the amount of sugar in the formula is kept low, the infant usually getting less than 45 calories per pound. If the weight fails to increase, the milk mixture is strengthened according to the requirements of the individual. The change from protein-milk to cow's milk takes place arbitrarily at 10 pounds on account of the cost of the food.* Normal infants of this weight, thriving on protein-milk, will usually do equally well on a rational formula of cow's milk.

OUTLINE.

Age	Weight	No. of Feedings	Amount	Method	Remarks
Birth	2 lbs. 8 ozs.	12	ʒii	gavage	Diluted, pasteurized breast milk.
1 week	2 lbs. 5 ozs.	12	ʒii	gavage	Breast milk
2 weeks	2 lbs. 8 ozs.	12	ʒvi	gavage	Breast milk
3 weeks	2 lbs. 13 ozs.	8	ʒx	gavage	Breast milk
4 weeks	3 lbs. 4 ozs.	8	ʒx	4 gavage 4 Breck	Breast milk
5 weeks	3 lbs. 12 ozs.	8	ʒxii	Breck	Breast milk and protein-milk
6 weeks	4 lbs. 4 ozs.	8	℥ii	4 protein (Breck) 4 breast (bottle)	Breast milk and protein-milk
7 weeks	4 lbs. 12 ozs.	7	℥ii	4 Breck 3 bottle	Protein-milk
12 weeks	6 lbs.	7	℥iii	bottle	Protein-milk, 6 tablespoonfuls (level, packed), water, 18 ounces, dextri-maltose, 2 talespoonfuls.
16 weeks	7 lbs. 2 ozs.	6	℥iii	bottle	Protein - milk increased to 7 talespoonfuls (level, packed)

ILLUSTRATIVE CASES

The following 4 typical cases are appended to illustrate somewhat in detail the use of protein-milk, (1) as a complemental food for prematures; (2) as an exclusive diet for prematures;

---

*A quart of such protein-milk costs about 35 cents.

(3) as an exclusive diet for young infants much under weight, and (4) as an exclusive diet for the new-born.

CASE 1. Thomas N. was born October 25, 1920, weighing 2 pounds and 8 ounces. When 8 hours old, he was given by gavage ¼ ounce of diluted breast milk. This was repeated every 2 hours. After 2 days he was given ¼ ounce of undiluted breast milk. At the end of the week the quantity was appreciably increased (see outline). As the mother's milk supply was very scant, in spite of routine manual expression,* most of the breast milk was gotten from other sources and pasteurized. At the age of 5 weeks, he was given 4 protein-milk feedings and 2 weeks later he received an exclusive protein-milk diet. At the age of 6 weeks he was put to the breasts several times a day, but weighing before and after showed that he got very little from this source. At the age of 5 months, protein-milk feedings were discontinued, at which time the child weighed over 10 pounds. During the 14 weeks of exclusive protein-milk feedings there was a gain of 88 ounces. He was given 3 drops of syrup of iodide of iron daily, beginning at 4 months; at 5 months he received 10 drops of phosphorized cod liver oil twice a day. Orange juice was also started at this age. He never regurgitated his food, nor did his bowels ever move more than 4 times a day. His weight at 12 months was over 18 pounds, the fontanel being about the average size; he had 6 teeth, and could stand when supported.

CASE 2. Premature baby fed protein-milk exclusively from the third week. Barbara R., was born March 27, 1921, weighing 4 pounds and 3 ounces. Due to extremely inverted nipples, it was impossible for the mother to nurse the first 2 children. Breast milk was gotten from another source and the child was given pasteurized breast milk by gavage every 3 hours,* beginning 8 hours after birth. At the end of the first week she weighed 2 ounces less than at birth. During the second week she gained 8 ounces, during which time the food was given by means of a Breck feeder. Before the end of the third week she received protein-milk exclusively, 3 of the 7 feedings being given by bottle.

---

*We always endeavor to maintain, augment, or complement nursing as long as the ninth month. We have found manual expression of the breasts 4 to 6 times a day, as recommended by Sedgwick[7] and others, invaluable in this regard. Breasts containing more milk than an infant needs are routinely emptied several times a day in order to maintain the supply until the infant is capable of using the entire amount. Without this measure, an overabundant supply frequently dwindles rapidly. We have, in numerous instances, been able to maintain a breast milk supply for weeks or months until the premature infant is strong enough to nurse. Intelligent, patient, gentle but thorough expression of residual milk frequently increases a deficient supply, or maintains it until the child can give the breasts sufficient stimulation. The technic, as is well known, consists of 3 steps:

(1) After placing the ball of the thumb and index finger of one hand on opposite sides of the nipple just outside the pigmented area, they are pressed firmly against the breast.

(2) Maintaining this pressure, the thumb and finger are brought toward each other in back of the base of the nipple.

(3) The thumb and finger then pull forward slightly, whereby the milk is forced out.

The food was made as follows:

Protein-milk powder	5 level, packed tablespoonfuls.
Water	16 ounces.
Dextri-maltose	2 level tablespoonfuls.

The food was strengthened and increased from time to time.

This case illustrates the influence of early gavage feedings on the initial weight loss and the rapidity with which a premature may gain weight on food other than breast milk without developing colic, etc. This premature gained 6 pounds in 14 weeks of exclusive protein-milk feeding, an average of one ounce a day. In very few of over 60 prematures has powdered protein-milk failed to be of great service.

Young infants suffering from inanition due to underfeeding usually make remarkable gains on protein-milk feedings. The following case is selected from a large series of such cases because the child got an exclusive protein-milk diet for over 7 months, during which time he gained 12½ pounds.

CASE 3. Burton B., the fourth child, was born at term, December 11, 1920, weighing 6 pounds and 5 ounces. He was breast fed for 6 weeks and, failing to gain, was given 3 ounces of a weak milk mixture after nursings. When seen for the first time, February 26, 1921, the 11-week old infant weighed 6 pounds (5 ounces less than at birth). There was no subcutaneous fat, the lips were pink, the color somewhat gray, the hemoglobin was between 50 and 60 per cent., the urine was normal, the stools were scant but of good quality. The abdomen was soft and there was no vomiting. The rectal temperature was subnormal. He got no milk from the breasts. A diagnosis of inanition, bordering on atrophy, was made, and the following formula was prescribed:

Albumin-milk powder, 5 (6, 7) level tablespoonfuls.
Water, 24 ounces.

---

*Our infants under 4 pounds usually receive 8 feedings, those between 4 and 7 pounds are fed 7 times, those from 7 to 10 pounds get 6 feedings and those above 10 pounds are fed 5 times in 24 hours.

Dextri-maltose, 2 (2½, 3) level tablespoonfuls.

3½ ounces in 7 feedings (to be increased as outlined every 3 days).

He gained 4 ounces during the first week. The food was then increased to:

Albumin-milk powder, 8 (9, 10) level tablespoonfuls.

Barley water, 24 ounces.

Dextri-maltose, 2 (2½, 3) level tablespoonfuls.

3½ ounces in 7 feedings (to be increased as outlined every 7 days).

At this time 20 drops of phosphorized cod liver oil twice a day were prescribed, also 4 drops of syrup of iodide of iron daily, as well as small quantities of orange juice. The weight chart shows how he progressed. When 15 weeks of age he weighed 8¼ pounds. When he returned 6 weeks later, he weighd 10½ pounds. The family were going West for the summer, and the mother asked that the child remain on protein-milk.

On May 15th the following outline was given:

Albumin-milk powder, 11 (13, 15) level tablespoonfuls.

Barley water, 28 (30, 32) ounces.

Dextri-maltose, 3 (4, 5) level tablespoonfuls.

6 (6½) ounces in 5 feedings (to be increased as outlined when the child failed to gain 5 ounces a week).

The phosphorized cod liver oil, iron and orange juice were increased. After 5 months the mother returned, at which time the boy was 9 months old, and weighed 18½ pounds. He had 4 teeth, the flesh was firm, the hemoglobin tested 80 per cent. There were no signs of rickets. The child was bright and active. During the 7 months of exclusive protein-milk diet, the weight increased 12½ pounds—about an ounce a day for over 200 days. The food was kept between 50 and 60 calories per pound per day.

CASE 4. Typifies the simplicity of exclusive protein-milk feedings. Dwight O. was born August 4, 1921, weighing 8¼ pounds. The father, a physician, insisted that artificial food be started at once on account of the extreme inversion of the mother's nipples. During the first week the child was given increasing amounts of protein-milk without the addition of carbohydrate. During the second week, 18 ounces of protein-milk (with 1 per cent. additional carbohydrate) was given daily. The birth weight had been regained when the child left the hospital at the end of 2 weeks. The formula consisted of:

Protein-milk powder, 8 (level, packed) tablespoonfuls.
Water, 24 ounces.
Dextri-maltose, 2 level tablespoonfuls.
Divided into 6 feedings.

At the end of the first month, the weight was a pound more than at birth. At the end of the second month, it had passed 11 pounds, at the end of the third, it was over 14. The infant never had colic, vomiting, or diarrhea, in spite of extremely hot weather. After the sixth week he was given only 5 feedings in 24 hours. He never received breast milk.

Most of our cases between 7 and 10 pounds gained rapidly when we used a level packed tablespoonful of protein-milk for each pound of weight (sufficient carbohydrate being added to bring the total up to 4 or 5 per cent.). Smaller infants often required a little more food, larger ones usually thrived on somewhat less. Powdered protein-milk is a safe substitute for breast milk and can be used as a complemental food without causing many of the disturbances encountered in the feeding of young infants.

SUMMARY.

1. Eiweissmilch is difficult to prepare, preserve and feed.
2. Powdered protein-milk, diluted with water and enriched with carbohydrate, is very efficacious as a prophylactic or complemental food for very young infants.
3. Powdered protein-milk may be used in various concentrations.
4. Symptoms of overfeeding and indigestion are rare in young infants fed on protein-milk as a complemental food or as an exclusive diet.
5. The careful transition to cow's milk mixture at ten pounds is seldom accompanied by unfavorable symptoms.

REFERENCES.

1. Meyer, L. F.: Jahrb. f. Kinderh., 71, 1910.
2. Finkelstein: Berl. klin. Wchnschr., 47, 1165, 1910.
3. Grulee: Infant Feeding, 3rd edit., 1919.
4. Wilcox and Hill: Am. J. Dis. Child., 5, 297, 1913.
5. Finkelstein: Lehrbuch der Säuglingkrankheiten, 2nd edit., 1921.
6. Holt and Falls: Am. J. Dis. Child., 22, 371, 1921.
7. Sedgwick: J.A.M.A., 64, 417, 1917.

CERTAIN ASPECTS OF MEASLES.*

By Philip Moen Stimson, M.D.,

Instructor of Pediatrics, Cornell University Medical College; Assistant Attending Physician, Willard Parker Hospital, New York City

From October, 1919, to May, 1920, there were about a third more cases of measles reported on Manhattan Island, or New York City proper, than of all the other acute contagious diseases of childhood combined. Diphtheria, scarlet fever, mumps, whooping cough, chickenpox, and German measles altogether totalled only 11,725 cases while there were reported 15,481 cases of measles.[1] When a disease can be so prevalent, it is occasionally of interest to discuss the less widely familiar aspects of the condition, and to refresh one's mind on some of the better known.

Certain other figures from reports[2] of the New York City Department of Health are worthy of note. Of over 6,000 studied cases of measles, just half occurred in the school years of 5 to 14; only 2 per cent. occurred in older people, while the remaining 48 per cent. were in infants and children of the pre-school period. Yet of the deaths from measles in the City of New York in 1919, 95 per cent. were in children 4 years old and under, although less than half of the cases occurred in children of that age. Accordingly, under ordinary circumstances, the longer a child lives before contracting the disease, the greater are his chances of recovery.

It is true that young men, American army recruits, died in great numbers of measles during the war but in their case there was the added factor of a secondary streptococcus infection. It is interesting to note that the British army, while it had its share of cases of measles, had very little pneumonia. I was for 6 weeks in 1918 in charge of the measles patients at the British Contagious Hospital at Rouen, during which time, though there were never less than 30 cases in the 2 wards, only one man contracted bronchopneumonia, and he got well. The men were of all the types that made up the British army, that is, Canadians, English, Australians, and the like, but why they were spared the pneumonia we did not know. One possible reason suggested was that the British do not ordinarily chew tobacco or gum, and spit promiscuously; another was that possibly they were made more hardy by a rather more rigorous training. Whatever the explanation, their measles patients got well, and escaped pneumonia.

---

*Read before the Clinical Research Society, November 17, 1920, and in part, before the New York Academy of Medicine, Section on Pediatrics, March 10, 1921.

The specific organism for measles of course is not known as yet, but Blake[3] and Trask have recently shown conclusively in monkeys that the infecting virus exists in the excretions of the nose and throat, in the skin, and in the blood plasma, and is filtrable. Their work has been a big step forward in the knowledge of measles. Now we may hope for information as to the exact nature of the virus, and under what conditions and how long it can keep its infectivity outside the body. And particularly we may hope that they will give us some means of inoculating susceptiple children against infection. In the meantime we must continue the compilation and discussion of clinical data in the hope of further improving the methods of prevention of the disease.

Most authorities agree that measles is not air-borne, except in so far as coughing and sneezing can spray the virus around, and a doctor or nurse must come very directly from a case to carry the infection to a susceptible person. Yet a recent article, from Chicago says that at the Municipal Contagious Disease Hospital there, they are confident that measles and chickenpox are air-borne to some extent at least. The author writes:[4] "Measles may be carried by a draught from one end of a ward to another, and the tendency of the infecting organism is always to travel upward in a building. Instances of the latter have been witnessed at the Cook County Hospital where the infection passed up a ventilating shaft from a child suffering with measles on one floor to attack a susceptible in the room immediately above. Even where there was no direct connecting link, as in the case of the ventilating flue, it has been noted that the disease travelled from a patient on one floor to a child occupying the room directly over it. The only explanation for such instances, several of which have been studied, was, since they occurred at a period of the year when windows were open, that the infection passed out of the window on one floor and in the window on the upper floor."

The best teaching[5] today, however, is that neither the virus of measles nor that of any other of the acute contagious diseases is air-borne as such. Droplets of moisture can carry the virus, and can be coughed 5 feet or so, but when the infection has been carried from one room to another or even from one end of the ward to the other end, surely a carrier in the form of a person or a fomite must be responsible.

So shortlived is the measles virus that once the discharges have ceased from the eyes, ears, nose and throat, the danger of infecting others is past, and the Department of Health of the City of New York releases from quarantine patients on the fifth day after the appearance of the measles eruption even though the eruption has not entirely faded, but provided of course that these discharges have ceased. And fumigation as such is dispensed with.

Another aspect of the transmissibility of measles arises in a discussion as to how long before his rash appears shall the patient be considered infectious. The prodromal period of invasion characterized by symptoms of coryza, conjunctivitis, tracheobronchitis, Koplik's spots, and an enanthema, is well known as the period most dangerous to others, and as usually lasting 3 or 4 days. But in Holt's series of 270 cases,[6] 60 prodromal periods or nearly one fourth, lasted longer than 4 days, and 11 such periods, or 4 per cent., were even longer than 6 days. In unusual instances, patients have been known to transmit the disease to other children by exposure 4 days before the appearance of the typical eruption.

A "cold in the nose" is often spoken of as the first symptom in the the prodromal period of measles. That it is not the first symptom is shown in the accompanying charts. Herrman[7] has charted the days of first appearance of the prodromal symptoms of 300 secondary cases of measles which occurred in hospitals and other institutions, cases which were closely observed in their incipience. The chart (No. 1) shows in the percentage of cases, the number of days that elapsed between the time of infection and the appearance of fever, of catarrh, of tonsillar manifestations, sometimes called the enanthemata, of Koplik's spots, and of the eruption. It reveals the long periods during which these symptoms may severally appear. Further analysis of the figures reveals the following facts as shown in chart No. 2. The symptom with the earliest *average* time of appearance was fever, at 10 days and 11 hours; then came the tonsillar spots at 11 days exactly. Another half day later came the average time of appearance of the catarrh at 11 days and 15 hours. The Koplik's spots appeared after still another half day, at 12 days and 2 hours; and then, after a day and a half more, or 3 full days from the first symptom, came the average time for the appearance of the eruption, at 13 days and 14 hours. Since presumably it is the catarrh which is the principal cause of the spread of the infection, it is interesting to note that the average duration of the catarrh before the rash appears is approximately 2 days. But before the catarrh appears, fever has usually been present for 24 hours. Herein we have further evidence that secondary cases of measles, particularly in institutions, can usually be detected earlier with a thermometer than with a tongue depressor.

CHART NO. 1.

Showing the number of days that elapsed between the time of infection and the appearance of the early manifestations in 300 secondary cases of measles. Given in percentages of cases. (Herrman[7]).

Days	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Fever	4.	6.3	13	33	23	7.6	6.3	4.3	1	.6				
Catarrh	.4	.7	4.7	14	34	26	9.8	5.	1.5	2.5	1.1		.3	.3
Ton. Manifes..	4.		14	16	25	22	18							
Koplik's			2.8	10	28	26	18	7.4	2.3	2.8	.9		.5	.5
Eruption				1.5	6	18	29	20	13	6.	3.5	1.5	.3	.3

CHART NO. 2.

Showing the *average* number of days and hours that elapsed between the time of infection and the appearance of the various early manifestations of measles. Also showing the priority of the manifestations. Based on the figures of Chart No. 1

	Days	10	11	12	13	14	
Fever	10 days 11 hours,	|					
Ton. Manifes.	11 days 0 hours,		|				i. e., about 12 hrs. later
Catarrh	11 days 15 hours,		|				i. e., about 12 hrs. later
Koplik's	12 days 2 hours,			|			i. e., about 12 hrs. later
Eruption	13 days 14 hours,				|		i. e., about 36 hrs. later

Incidentally, Winters in his clinics at Cornell, used to state that Koplik's spots can be found on the swollen inflamed caruncle at the inner canthus of the eye. This occasional location of Koplik's spots is also mentioned in one of Herrman's articles.[8] In the last 15 measles patients with buccal spots that I have examined I have found the caruncular Koplik's spots more or less definite in seven.

Brownlee,[9] Director of Statistics of the British Medical Research Committee, feels that for administrative purposes there are only two symptoms "which are of the smallest particle of use, nor are these of any certain value." He continues: "The first and most important of these symptoms is a rise of temperature. The second symptom is edema of the conjunctiva. This is much the earliest symptom of the catarrh to appear. The edema is confined to the palpebral conjunctiva and especially that of the lower lid." Brownlee feels that by the time the pathognomonic Koplik's spots are found, the patient has had a dangerous contagious catarrh for an appreciable length of time.

In a recent ward epidemic in a hospital in New York City, it seemed practically impossible to stamp out the disease by isolating the patients only when Koplik's spots were found. And yet there were not the facilities by which each child with an unexplained rise of temperature could be isolated from every other child. Accordingly, edema of the lower eyelids was watched for, with the result that in a number of instances strong suspicion of measles was fastened on several children and isolation established a day or more before their Koplik's spots were found.

In a recent study of the secondary cases of measles that occurred among the children of a certain large private school, analysis was made in particular of the cases that were apparently of school origin. In 26 cases, where there was trustworthy information, the incubation period from exposure to the first symptom of ill health noted by the parents, usually coryza, varied the customary period of 8 to 14 days inclusive, with an average of 11¾ days, while in 41 cases, the same or others, the period from exposure to the appearance of the eruption varied from the 9th to the 18th days inclusive; the average being 13½ days, or about 2 days longer. These two averages agree almost exactly with those found in chart No. 2.

But the school authorities particularly wanted to know when to consider the children of a given classroom as having been exposed to the infection. Accordingly, in the accompanying chart (No. 3), it was shown that of over 200 susceptible children exposed in classrooms, about one-fifth contracted the disease when exposed 1, 2, or 3 days before the appearance of the typical eruption on a classmate. But no infected child, who attended school on the fourth day before his rash appeared, passed on the infection to a classmate. Three days apparently were dangerous, one more than the average duration of the catarrh. Hence the arbitrary rule was adopted that when a measles patient had attended school within 3 days of the appearance of his eruption, he exposed his susceptible classmates, and with the likelihood that one-fifth of them would contract the disease, and show prodromal signs some time between the seventh and fifteenth days thereafter, all these susceptible classmates shall be excluded from school between those days.

Brownlee[9] further advises that when an excluded exposed child has younger brothers or sisters, especially between the ages of 6 months and 3 years, the parents be advised to send the exposed child to the home of some relative where there are no susceptible children, thereby giving the younger brothers or sisters a chance to grow a little older before catching this apparently inevitable infection which is so serious to toddlers but which is comparatively well borne by older children.

The association of measles with other acute contagious diseases is in no way uncommon. In fact measles and whooping cough appear together frequently, and in hospitals for contagious diseases, diphtheria has been very liable to complicate the course of measles. Cases of scarlet fever coming on during the convalescence of measles, and cases of measles coming on during the convalescence of scarlet fever are also not uncommon, but the simultaneous appearance of the eruptions of the 2 diseases is comparatively unusual. Miller[10] recently reported one such instance in a boy of 8, a curious feature being that the 3 other children in the family all contracted measles but not scarlet fever. Miller referred to other cases in medical literature of the double infection and stated that Huckciwiez had observed 21 cases of combined scarlet fever and measles, apparently not all with simultaneous eruptions, however. Hoyne[4] reported a case of a child admitted to hospital with laryngeal diphtheria, who de-

CHART NO. 3.

Showing figures concerning infections resulting from classroom exposure, of children who had not previously suffered from measles.

5	Children,	as late as	1	day before the rash appeared,	exposed	24	susceptible children, of whom	5	caught measles,	or 20.8%
10	"	"	2	"	"	56	"	11	"	24.4
18	"	"	3	"	"	122	"	19	"	18.4
5	"	"	4	"	"	26	"	0	"	0.0
6	"	"	5	"	"	38	"	0	"	0.0

veloped 24 hours later a cutaneous eruption typical of measles, 24 hours later still a typical scarlet fever rash, and three days later a profuse chickenpox eruption with subsequent new crops. An unusual fact about this case is that on admission to the hospital and five days before the appearance of the first real crop of chickenpox, a diagnosis of chickenpox was made on the finding of what was taken to be a single typical pock on one ankle. Apparently there were no further signs of this disease for five days. This patient recovered from all these diseases very quickly and without further complication.

There was in the Willard Parker Hospital in March, 1920, a small boy who came in with scarlet fever, developed whooping cough almost at once, and measles very soon after, also bronchopneumonia and bilateral purulent otitis media, and yet recovered.

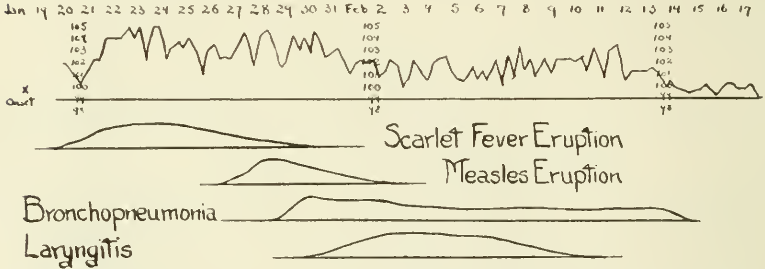
The following is the case report of a somewhat similar combination of diseases:

CASE REPORT.

Victor, a 4½ years old boy of Dutch and English parentage, was first seen Wednesday, January 21, 1920, with complaints of fever, sore throat, and a general erythematous eruption. His parents were of the intellectual class and usually in robust health as were also the 3 other children, all older than the patient. The boy had lived the first 4 years of his life in Holland during the period of the World War and at a time when food was scarce and not of the right kind. Frequently the children went to bed hungry. At 9 months of age, Victor had bilateral mumps, and his mother says he was very sick for a long time, the swelling on each side rising and falling 3 times. When he came to America in September, 1919, he was in fairly good condition and during the autumn he was quite well except for an occasional mild attack of bronchitis which seemed particularly hard for him to throw off. He had had no other contagious diseases than mumps. His life was quite regular and he seemed a well built, stocky child in an apparently rugged family.

On Sunday evening, January 18, 1920, he vomited. The next day he seemed pretty well, but an enema was given to relieve some abdominal distress, and with success. He was observed to have a slight cold in his nose. The next day, Tuesday, he was feverish and a rectal temperature was found to be 102°. A red confluent rash was noticed on his back that afternoon, and accordingly the next morning the mother asked that the boy be visited for what she thought was measles because of the presence of the disease in other classes in the school. Incidentally, a subsequent study failed to reveal any probable source in the school of infection with any contagious disease, Victor having attended an isolated kindergarten class.

That Wednesday afternoon, the fourth day of the illness if Sunday's vomiting denoted the first day, Victor was found to have 102.2° temperature by rectum, circumoral pallor, a typical strawberry tongue, and a typical extensive scarlet fever eruption. There was a profuse seropurulent discharge from the nose; the fauces were injected but showed no eruption nor exudate, and there were no Koplik's spots. There was a moderate tight cough, but the lungs seemed quite clear. However, the next day there was a definite bronchitis and the fever had mounted to 104°. By the following, or sixth day, the rash seemed at its height and there were also small points of subcutaneous hemorrhage, especially on the following day. Examination of the throat was difficult, but as far as could be made out there was now quite marked inflammation and some edema, and the whole mouth was dirty, since the child resented having anything done to clean either mouth or throat. The submaxillary glands on each side were markedly swollen and tender. The eighth and ninth days the fever abated slightly and the rash faded somewhat. The lungs seemed practically clear, and still no Koplik's could be dis-



tinguished. The next day, the temperature rose again, malaise and cough increased, his eyes were sore and congested, and a slightly elevated macular rash was found on the wrists and behind the ears. Between the areas of this new eruption could still be noted the erythematous congestion remaining from the scarlet fever rash. No Koplik's could be made out, but his mouth was dirty. However, the next, or eleventh day, there could be seen on the mucous membranes lining the cheeks a number of spots which, though much obscured by sordes, were taken to be Koplik's spots, especially since the macular eruption had spread to the face and trunk and was now quite typical of measles. Moist râles of an acute bronchitis were noted at the left base. The following day there was a definite patch of bronchopneumonia under the left anterior axillary fold, and the child seemed desperately ill. Dr. F. S. Meara was called in consultation and the diagnoses of scarlet fever, measles, and bronchopneumonia confirmed. The subsequent day, the child was delirious, but the following, or 14th day of the whole sickness and the 5th day of the measles eruption, the fever started to abate, the throat seemed better, the cervical glands were slightly less swollen, and the lungs seemed less full of râles. However, the cough began to sound rather croupy in character and became more frequent and irritating. Up to and including 11 p. m. of this day, the ear-drums were always apparently clear, but the next noon the right ear began to discharge freely even with a falling temperature, and 24 hours later the left ear began also. During the next 3 or 4 days, while an extensive desquamation went on, the patient grew brighter and had a better appetite, but the fever continued to rise above 102° each day, and a severe deep barking cough robbed him of much sleep. He lost his voice entirely and could only whisper, a severe catarrhal laryngitis with mucus and some edema having set in. A nose and throat culture was negative for diphtheria bacilli. Marked swelling of the submaxillary glands persisted.

Towards the close of the third week he seemed much improved, being brighter and with far less cough, but he remained very weak, and the fever started mounting again, going over 103° on the 22nd day of his illness, the 11th day of the bronchopneumonia. The physical signs over his lungs, from giving quite frank evidence of areas of bronchopneumonia in both lungs posteriorly with a severe general bronchitis, had diminished somewhat so that there was very little bronchitis remaining, and no marked dullness anywhere, though it was thought that there was still some consolidation in each lung beneath the inferior angles of the scapulæ. The fever continued and on the 24th day Dr. L. M. Hubby was asked to rule out any cause in the head for the fever. Both ears were still discharging profusely, but the specialist could find no cause in the head for the fever of over 102°. The 25th day, the 14th of the bronchopneumonia, there still was found some dullness, distant bronchial breathing and râles near the inferior angle of each scapula, possibly more marked on the left side than on the right and the signs persisting to the next day, an exploratory puncture was made into this dull area on the left side, but no pus was obtained, even though an attempt was made to hit by deep aspiration a possible interlobar empyema. A very extensive subcutaneous emphysema lasting several days resulted, however. Dr. Meara was again asked to give an opinion. He suggested 3 possible diagnoses in this order: 1, empyema; 2, pus in the head; and 3, an unresolved bronchopneumonia. Accordingly Dr. Hubby was again asked to rule out the second possibility, but this time he found evidence of some possible trouble in the right mastoid bone, though not enough to warrant operation. A portable x-ray machine was brought and films made of the head and lungs. The resulting report was, "The right chest shows an area of unresolved pneumonia about the size of a half dollar at the level of the angle of the scapula. The root shadows on both sides are increased. There is no evidence of empyema. The frontal sinuses are clear and the maxillary sinuses are alike on the two sides. The mastoid air cells are not yet developed. The right mastoid antrum shows a dense shadow of pus. On the left side the antrum contains a little pus but is nearly clear."

The next day, the 17th of the bronchopneumonia and the 28th of the illness, the boy's fever dropped to 100° rectal and thereafter stayed down. The blood count on the 30th day was 10,350 white blood cells with 76 per cent. polynuclears. His urine at no time showed more than a trace of albumen. His ears continued to run more or less freely for some time, but finally, on the 56th day of his illness, March 13, they seemed dry and he was released from quarantine. His subsequent convalescence was fairly steady, though marred by a severe case of chickenpox towards the end of March, by an acute alimentary upset in April, and by an attack of scabies in May. During the spring and summer there was an occasional slight discharge from each ear Accordingly an operation for the removal of tonsils and adenoid tissue was advised and eventually done, since when there has been very little discharge from the ears. He is still a little deaf in each ear, however.

Among the interesting features in connection with this case are the following:

1. The eruptions of measles and scarlet fever were present at the same time.

2. The times of infection with the 2 diseases may have been nearly simultaneous. The 13th day back from the appearance of the measles eruption was the 4th day before the initial vomiting which apparently denoted the onset of the scarlet fever.

3. The otitis media developed at a time when the temperature was falling and constant careful watch failed to reveal clinical manifestations before the actual appearance of the pus in the external auditory canals.

4. The bronchopneumonia appeared to be so slow in resolving that the presence of empyema was considered probable, and yet the final resolution on the 17th day was not remarkably late. In Holt's series[11] of cases of bronchopneumonia, 1/5 of the cases lasted longer than 21 days, both of those who eventually died and of those who eventually recovered.

SUMMARY.

Except under unusual circumstances as in army cantonments, measles is more serious the younger the patient. The infecting virus, shown by Blake to exist in the blood, catarrhal discharges, and skin, is probably not air-borne. The prodromal stage is a markedly infectious period, particularly after the catarrh has begun. The first symptom usually is fever, appearing after an interval of incubation variable in length, but averaging 10½ days, while the catarrh appears about 24 hours later, though usually 48 hours before the appearance of the rash. It follows theoretically and practically that during the three days before the rash appears an infected child is likely to transmit the disease to a considerable proportion of such susceptible children as may come in direct or indirect contact with her.

Measles is frequently complicated by the presence of other contagious diseases, but the simultaneous presence of the eruptions of measles and scarlet fever in the same patient is unusual. A report is given of a case wherein these 2 eruptions were noted existing together, the two diseases being further complicated by catarrhal laryngitis, bronchopneumonia, and bilateral purulent otitis media.

25 Claremont Ave.

BIBLIOGRAPHY

1. Compiled from figures given in Monthly Bulletins of The Department of Health, City of New York.
2. Personal communication from Dr. Louis J. Harris, Director, Bureau of Preventable Diseases, Department of Health, City of New York.
3. Blake, F. G.: Measles Experimentally Produced. Arch. of Ped., XXXVIII, 2, p. 90, Feb., 1921.
4. Hoyne, A. L.: An Unusual Instance of Multiple Infections. Arch. of Ped., XXXVII, 10, p. 606, Oct., 1920.
5. Park, W. H.: Personal communication.
   Meara, F. S.: The Treatment of Acute Infectious Diseases, Macmillan, 1916, p. 269.
   Holt, L. E.: Diseases of Infancy and Childhood, 7th Ed., Appleton, 1917, p. 977.
6. Holt, L. E.: ibid., p. 979.
7. Herrman, Chas.: Observations on Measles, Arch. of Ped., XXXIV, 1, p. 38, Jan., 1917.
8. Herrman, Chas.: Measles: Incubation, Infectivity, Immunity, Early Manifestations, Arch. of Ped., XXXI, 12, p. 885, Dec., 1914.
9. Brownlee, John: Public Health Administration in Epidemics of Measles, British Med. Jour., Ap. 17, 1920, p. 534. Also reviewed in an editorial by Victor C. Vaughan, The Control of Measles, Jour. of Lab. & Clin. Med., VI, 2, Nov., 1920, p. 114.
10. Miller, D. J. M.: Scarlet Fever and Measles Occurring Simultaneously in the Same Individual. Arch. of Ped., XXXIV, 2, p. 139, Feb., 1917.
11. Holt, L. E.: ibid., p. 511.

ADENOIDS IN NURSLINGS (Médecine, Paris, Aug., 1921). G. L. Hallez remarks that the adenoids may be congenital or develop after recurring coryza. Before the age of 4, surgical measures are seldom indicated, he says, on account of the almost inevitable recurrences, unless one's hand is forced by inflammation or otitis or bronchopulmonary complications, or the obstruction of the passages interferes with feeding. A little stretching with forceps may be enough to open the passage, and calcium and epinephrin given (2 drops of 1:1,000 epinephrin two or three times a day), with local measures.—*Journal A. M. A.*

INCIDENCE OF THE WASSERMANN REACTION IN A LARGE CHILD-CARING INSTITUTION.*

BY LOUIS H. BARENBERG, M.D., New York,
AND PHILIP ROSENBERG, M.D., Syracuse.

Since the employment of serology in the study of congenital lues, the detection of this condition has been greatly facilitated. A review, however, of the literature on the incidence of this disease reveals a wide variation of opinion. The incidence appears to be higher in the European countries than in America. Epstein[1] obtained Wassermann reactions in 3.3 per cent. of 236 newly born infants in the Prague Foundling Asylum. Holt[2] found 6 per cent. positive reactions among 178 general hospital cases. Elliott[3] reported 10.8 per cent. positive among 130 hospital children in Glasgow. Steinert and Flusser[4] state that among 2533 infants from a children's clinic in Prague 5.7 per cent. were syphilitic. Blackfan, Nicholson and White[5] found the Wassermann reaction positive in 2 per cent. of 101 hospital infants. Whitney[6] reports 2.9 per cent. of syphilis in 915 children in an out-patient department. Among 5180 children in a St. Louis hospital, Jeans and Buttler[7] found 108 cases (2 per cent.) of hereditary lues. Jeans[8], from a review of the literature, concluded that from 5 to 6 per cent. of living infants of the poorer class have syphilis.

Taking into consideration similar statistics in European cities, we find that among the children admitted to the Frankfort hospital clinic, Lange[9] found 2.8 per cent. to be syphilitic. Wirtz[10] did Wassermann tests in Munich on 200 school children whose history and physical findings were negative in regard to syphilis and found an incidence of 3 per cent. In a maternity clinic in Munich, Saengel found that out of 1500 mothers, 147, or 9.8 per cent., were syphilitic, and 119 out of the 147, or 81 per cent. of their children gave positive Wassermann reactions. Bjorkenheim found that among 100 mothers giving a positive reaction, 75 per cent. had children who were serologically positive. The findings of Leroux and Labé were almost identical, as they found 78 per cent. of such positive. In the Prague Foundling Asylum referred to above, Steinert and Flusser[4] found that out of 100 serologically positive mothers only 37 per cent. of the children were serologically positive. A survey of the literature which has been cited leads to the conclusion that the Wassermann reaction is not absolutely reliable in regard to congenital lues in small infants.

---

*From the Home for Hebrew Infants, New York City.

There have been comparatively few studies of the incidence of congenital lues among large groups of institutional children. The children tested in our study were inmates of a large child-caring institution. The majority of these children were under observation for a period of 2 or more years. They varied in age from a few days to 6 years, and were drawn from the poorest of New York City's population. Table 1 gives a general view of the cases on which our study is based. None of the infants or children at any time showed any clinical manifestations of syphilis. Among the 472 children, 106, (22.4 per cent.) gave a history of insanity in one or both parents; 51, (10.8 per cent.) were illegitimate; 31, (6.5 per cent.) were mentally backward; 169, (35.8 per cent.) showed various pathological conditions.

Wassermann tests on the blood of the children of this institution were performed by the New York City Department of Health* as a routine procedure on admission. In compiling the reports on 438 children, it was surprising to find that only 4 were found positive. All of these, however, on subsequent examination, were reported negative.

In view of the absence of definite positive Wassermann reactions and the inconsistent reports in 4 cases, we thought it desirable to have the blood examined by another laboratory and accordingly applied to the New York State Department of Health** to carry out such tests. Only one case was reported positive, and a second examination of this case by the same laboratory led to a negative report.

To obtain additional data the luetin cutaneous reaction for

***Technique*—Patient's serum—(11). The clear serum collected from the patient is inactivated at 56° C. for half hour.

Hemolytic system—Sheep cells washed 5 times and made up in a 5 per cent. suspension of saline.

Amboceptor—Three units used in sensitizing 0.1 c.c. of a 5 per cent. suspension of sheep cells.

Antigen—Alcoholic extract of a normal guinea pig heart.

Complement—Fresh serum of a guinea pig, 0.1 c.c. contains 2.5 units.

In making the test, the patient's serum, antigen, complement, and normal saline (to equalize the amount of fluid), are added in this order. The tube is kept at 8° C. for 4 hours. The amount of sheep cells necessary are sensitized by the addition of three units of amboceptor to each 0.1 c.c. of sensitized cells to each tube. The tubes are placed in a water-bath at 37° C. The results are read as soon as the antigen controls are completely hemolyzed. Each test is done in duplicate.

syphilis was performed.*** Most investigators agree that this test is of great value in diagnosing hereditary syphilis. Meyers[12], in work in an out-patient department, came to the conclusion that the test is more reliable in diagnosing congenital syphilis than the Wassermann reaction. Cohen[13] found that this test agreed with

---

*******Technique—Volume of test*—The total volume of the test is approximately 0.5 c.c., i. e., one-tenth the volume of the original Wassermann test. Each ingredient, except patient's serum, is diluted so that 0.1 c.c. may be used in the test.

Preparation of sera—The clear sera are inactivated by heating in a water-bath at 56° C. for one-half hour on the day the test is performed.

Hemolytic system—An anti-sheep hemolytic system is used. Fresh sheep's blood cells are washed 5 times in 0.85 per cent. saline, and then made up in a 5 per cent. suspension. The anti-sheep hemolytic serum is derived from rabbits immunized to sheep cells.

Complement—Pooled sera of 6 or more guinea pigs are used. Each guinea pig serum is subjected to preliminary tests before being incorporated in the pooled complement.

Amboceptor—Two units of anti-sheep amboceptor to sensitize 0.1 c.c. of 5 per cent. suspension of the sheep cells.

Quantity of serum tested—Patient's serum is tested in 2 quantities with antigen, 0.2 c.c. and 0.1 c.c., and twice these quantities are tested without antigen, as controls on the possible anticomplementary properties of serum.

Antigens used and method of fixation—Each serum is tested with 2 antigens, a crude alcoholic extract of beef-heart, with fixation period 4 hours at ice box temperature, 3°-6° C., and an extract of beef-heart re-enforced with 0.4 per cent. cholestrin, the fixation period being one-half hour in the water-bath at 37° C. The quantity of antigen used in the test is 0.1 c.c.

Method of performing the test—The patient's serum, antigen, and complement are placed into tubes and saline added to make the volume approximately 0.3 c.c. Each group of 18 tests includes a control test of a known four-plus syphilitic serum and a control of antigen alone in twice the quantity used in the test with patients' serum.

After the fixation period, 0.2 c.c. sensitized sheep cells are added to every tube and the racks placed in the water-bath at 37° C. until hemolysis is complete in the antigen control.

The test of patient's serum is read when hemolysis is complete in the control containing serum but no antigen. The fixation obtained is read by comparison with the positive control.

1. Fixation complete with both 0.2 c.c. and 0.1 c.c. of serum = four-plus.
2. Fixation complete with 0.2 c.c. and nearly complete with 0.1 c.c. = three-plus.
3. Fixation complete with 0.2 c.c. and partially complete with 0.1 c.c. = two-plus.
4. Fixation nearly complete with 0.2 c.c. and nearly complete with 0.1 c.c. = one-plus.
5. Fixation slight with 0.2 c.c. and slight with 0.1 c.c. plus minus.
6. Complete hemolysis in both tubes. No complement fixation obtained.

***The technique employed (20) in performing these tests was as follows: The luetin was prepared by Dr. Hideyo Noguchi at the Rockefeller Institute for Medical Research. Luetin is a suspension of the dead spirocheta pallida, made by emulsifying the medium in which the organisms are cultivated with salt solution, killed by heat and preserved with 0.25 per cent. tricresol. The forearm is washed with green soap and then with alcohol-dried and 0.07 c.c. of luetin is injected intradermally with a small hydrodermic syringe, forming a small white wheal. Readings were made every 24 hours after the injection.

Description of the reaction upon which the readings were based (20)—Normal or negative reaction—In a majority of normal persons, there appears after 24 hours, a small erythematous area at and around the point of injection. This reaction recedes within 48 hours and leaves no induration. In certain cases the reaction may reach the stage of a small papule forming in 48 hours and subsiding within 72 hours.

Positive Reaction.

A. Papular form—A raised reddish indurated papule .5 to 10 mm. in diameter, appears in 24 to 48 hours. This may be surrounded by a diffused zone of redness. Induration increases in the next few days after which the inflammatory process begins to recede. The color of the papule becomes dark bluish red. The induration usually disappears within a week.

B. Pustular form—The course of this reaction resembles the papular form until the fourth or fifth day when the inflammatory process begins to progress. The surface of the papule becomes vesicular at first and then purulent. The pustule is covered by a crust which falls off within a few days.

C. Torpid form—Injection sites fade to invisible points for 3 or 4 days and suddenly light up again in 10 days and progress to the pustular form as above.

both the Wassermann test and clinical signs. He found 47 negative and 3 atypical reactions in 50 healthy infants. He believes, therefore, that a positive test is strong presumptive evidence of syphilis. Grulee[14] thought that the luetin test has a distinct negative value, since the reaction was negative in all cases not luetic. Pussey and Stillians[15] found no instance of a positive luetin reaction in a non-syphilitic case. Kilgore[16] thinks the luetin test to be of considerable value in cases in which it is positive and the Wassermann reaction is negative. Hanes[17] concludes that the luetin test, if positive, is absolutely specific. Blechmann[18] reports positive results with the luetin reaction in the absence of syphilis in children. Corper, Gekler, and Sweaney[19] found that 47 per cent. of the patients (adults) admitted to a tuberculosis sanitarium gave positive luetin reactions.

TABLE 1—WASSERMANN TESTS.

Total No. of Tests	830
Tests by City Department of Health	500
Tests by State Department of Health	330
Total No. of Children Tested	472
Tested by City	438
Tested by State	326
Tested by City and State	295
Tested by City only	139
Tested by State only	34
Tested by City (Multiple Tests)	50

LUETIN TESTS.

Total No. of Children	350
Single Tests	301
Repeated Tests	49

Table 3 shows no positive Wassermann reactions in 31 mentally backward children, 5 of whom were idiots. Of these, only

TABLE 2—WASSERMANN TESTS.

A. CITY DEPARTMENT OF HEALTH.

No. of Cases	Test No. 1	Test No. 2	Test No. 3	Test No. 4	Test No. 5	Test No. 6
383	—					
25	—	—				
1	—	—	—			
7	±	—				
10	+	±	—			
1	+	—	—			
1	+	±	±			
1	++	—				
3	++++	—	—			
1	++++	—	—			
1	++++	++	±	—	—	—
434						

B. STATE DEPARTMENT OF HEALTH.

No. of Cases	Alcoholic	Cholestrinized
252	—	—
1	±	—
6	±	±
66	—	±
1	++++	+
326		

one was doubtful and another positive to the luetin test.* It has long been realized that hereditary syphilis plays a very important rôle in the causation of idiocy and arrest of brain development. Lippman[22] found 7 per cent. of syphilis among 78 juvenile idiots

---

*In order to familiarize ourselves with a positive luetin reaction, 2 children who reacted negatively to the first test were given potassium iodide, gr. V, t. i. d. Shenick[21] and many others have proven that this drug causes a positive reaction even in the absence of syphilis. The second test in these children during the administration of the drug was markedly positive.

TABLE 3—WASSERMANN AND LUETIN TESTS ON 31 MENTALLY BACKWARD CHILDREN.

No. of Cases	Wassermann			Luetin	Remarks
	City	State			
		A*	C**		
2	—	—	—	—	Chronic otitis.
2	—	—	—	—	Mother insane.
4	—	—	—	—	
1	—	—	—	—	Microcephalus, malnutrition.
2	—	—	—	—	Rickets.
1	—	—	—	doubtful	Spasmophilia convulsions.
2	—	—	—	—	Both parents deaf mutes.
1	—	—	—	—	Mother epileptic.
2	—	—	—	—	Illegitimate.
1	—	—	±	+	Chronic otitis.
1	—	—	—	—	Deformed head; peculiar gait.
1	—	—	—	—	Nystagmus, large head, trident hand.
1	—				General lymphoadenopathy, Exudative diathesis.
1	—				Saddle back nose, snuffles.
1	—	—	—	—	Nystagmus, vaginitis.
1		—	—	—	Mother insane; illegitimate.
1	—	—	—	—	Father insane.
1	—				Chronic nephritis.
1	—	—	—	—	Idiotic, illegitimate. Deformed head.
1	—	—	±	—	Idiotic.
2	—	—	—	—	Idiotic.
1	—	—	—	—	Idiotic, mother insane, vaginitis.

31

*Alcoholic.
**Cholestrinized.

as judged by the Wassermann reaction. After he included historical and clinical evidence, he judged its incidence to be 38.8 per cent. Atwood[23] found 14.7 per cent. of 204 idiots were syphilitic. McKay[24] found 6.8 per cent. of positive Wassermann reactions in 1550 cases of feeble-minded. Evidently among our cases syphilis was not the cause of backwardness.

Table 4 shows the results of Wassermann and luetin tests on 51 illegitimate children. Several observers have noted that hereditary syphilis frequently occurs among illegitimate children. All the cases gave negative Wassermann reactions, but 2 gave doubtful luetin reactions. Among the illegitimate children, a few showed in addition some pathological condition such as microcephalus, deformed palate, etc.

TABLE 4—WASSERMANN AND LUETIN TESTS ON 51 ILLEGITIMATE CHILDREN.

No. of Cases	Wassermann			Luetin	Remarks
	City	State			
		A*	C**		
25	—	—	—	—	
9	—	—	—	—	Mother insane.
2	—	—	—	—	Hydrocephalus.
1	—	—	—	—	Micocephalic, backward, malnutrition.
2	—	—	—	—	Backward.
1	—	—	—	—	Deformed head; backward.
1	—	—	±	—	Alopecia, marasmus, anemia.
1		—	+	—	
1	—				Alopecia.
1	—	—	—	doubtful	Malnutrition, alopecia, anemia.
1	—	—	—	—	Mother insane; anemia.
1	—	—	—	—	Mother insane; malnutrition.
2	—	—	—	—	Mother ++++ 3 mos. after Wassermann was taken on twins.
1	—	—	—	—	Spasmophilia.
2	—	—	—	doubtful	
51					

*Alcoholic.
**Cholestrinized.

Table 5 gives the results of Wassermann and luetin tests on 106 children with a history of insanity in one or both parents. In 93 the mother, in 6 the father, and in 7 both parents were insane. The Wassermann tests were negative, with the exception of a few which were ± with the cholestrinized antigen; this is considered negative. The luetin tests were negative except in 4 cases which gave a doubtful reaction. In these 4 cases the Wassermann test was negative. Several of the cases had in addition

TABLE 5—WASSERMANN AND LUETIN TESTS ON 106 CHILDREN WITH A HISTORY OF INSANITY.

No. of Cases	Mother Insane	Father Insane	Both Parents Insane	Wassermann			Luetin	Remarks
				City	State A*	State C**		
36	“			—	—	—	—	
2	“			—	—	±	—	
10	“			—	—	—	—	Illegitimate.
1	“			—	—	—	—	Deformed. External auricle.
5	“			—	—	—	—	Backward.
1	“			—			—	Illegitimate.
1	“			—	—	—	—	Rolling of eyes. Rickets.
15	“			—				
2	“			—				Rickets. Enlarged spleen.
1	“			—	—	—	—	Deformed head. Backward.
1	“			—	—	—	—	Chronic otitis.
2	“			—	—	±	—	Chronic otitis.
1	“			—	—	—	doubtful	Deformed palate, anemia, illegitimate.
3	“			—	±	±	—	Idiocy.
3	“			—	—	—	doubtful	
1	“			—	—	—	—	Premature, illegit. Slight fissure in ano.
1	“			—	—	—	doubtful	Exudative diathesis. Vaginitis.
3	“			—	—	—	—	Illegitimate. Rickets.
1	“			—	—	—	doubtful	Illegitimate. Rickets.
1	“			—	—	—	—	Illegitimate. Backward.
1	“			—	—	—	—	Petit-mal.
1	“			—	—	—	—	General adenopathy.
4		“		—	—	—	—	
1		“		—	—	—	—	Marasmus.
1		“		—	—	—	—	Backward.
1			“	—	—	±	—	Mitral regurgitation. Rickets.
4			“	—	—	—	—	
1			“	—				
1			“	—	—	—	—	Chronic nephritis.
106								

*Alcoholic. **Cholestrinized.

other conditions suggesting lues. One case which was illegitimate, premature and had a slight fissure in ano, gave negative Wassermann and luetin tests. Certainly a history of insanity was not a factor in the incidence of hereditary syphilis among this group of cases.

In this study we encountered a number of children showing various pathological conditions (Table 6) in which lues might be a factor, as congenital lues is considered by many observers to play an important rôle in the causation of these conditions. On the other hand, we found a lack of positive Wassermann reactions in these cases. For example, some consider syphilis as one of the causes of marasmus and malnutrition. In 26 cases admitted to the institution with marasmus, none were found to be syphilitic clinically or by laboratory tests. Only one gave a doubtful luetin reaction. Twenty children were admitted with marked rickets. Syphilis played no rôle as a cause, as they all gave negative Wassermann and luetin tests. It has been reported recently that chronic otitis in children may sometimes be of syphilitic origin. Out of 17 cases, all gave negative Wasserman, but one gave a positive luetin test. Two cases of chronic nephritis gave negative Wassermann and luetin tests.

REPORT OF CASE.

Alvin K., male, 1 year old, admitted March 20, 1920.

Family History. Father gave 4 plus Wassermann on the blood and the spinal fluid. Mother was negative repeatedly. No history of miscarriages.

Previous History. Child nursed for 10 months. Previous to admission he had been in a hospital under observation for a skin condition.

Physical Examination. Well nourished child weighing 18 pounds, with a bronzing and scaling of the skin over the entire body, somewhat similar to ichthyosis. This condition had been present since birth. The spleen and liver were not enlarged. There was no general glandular enlargement, and the epitrochlears were not palpable. X-ray examination of the bones was negative. The Wasserman test was negative. However, in view of the history, it was thought desirable to administer 0.1 gm.

TABLE 6—WASSERMANN AND LUETIN TESTS IN VARIOUS PATHOLOGICAL CONDITIONS.

No. of Cases	Wassermann City	State A*	State C**	Luetin	Condition.
14	—	—	—	—	Marasmus.
1	—	—	±	—	Marasmus.
1	—				Marasmus.
6	—		—	—	Malnutrition.
1	—	—	—	doubtful	Malnutrition.
1	—	—	±	—	Malnutrition.
9	—	—	—	—	Chronic otitis.
5	—	—	±	—	Chronic otitis.
2	—				Chronic otitis.
1	—	—	—	±	Chronic otitis.
18	—	—	—	—	Rickets.
1	—				Rickets.
1	—	—	—	—	Psoriasis.
8	—	—	—	—	Exud. diathesis.
1	—	—	±	—	Exud. diathesis.
1	—	—	—	doubtful	Exud. diathesis.
1	—				Ichthyosis. (Father four plus.)
3	—	—	—	—	Hydrocephalus.
4	—	—	—	—	Deformed head.
1	—	—	—	—	Deformity of palate.
1	—	—	—	doubtful	
1	—				Saddle back nose.
2	—	—	—	—	Nystagmus.
2	—	—	—	—	Snuffles.
1	—	—	—	doubtful	Spasmophilia.
1	—	—	—	—	Spasmophilia.
1	—	—	—	—	Petit mal.
2	—	—	—	—	Deaf mutes.
2	—	—	—	—	Chronic nephritis.
4	—	—	±	—	Gonorrheal vaginitis.
1	—				Gonorrheal vaginitis.
1	—	—	—	doubtful	Gonorrheal vaginitis.
70	—	—	—	—	Gonorrheal vaginitis.

*Alcoholic.
**Cholestrinized.

neoarsphenamine intravenously. Mercurial inunctions had been given. No improvement in the skin condition followed.

In order to rule out the presence of syphilis, 10 cases which showed suggestive symptoms and gave doubtful Wassermann reaction by the first test were selected. Nine out of these children were given calomel gr. 1/10 t. i. d. for 10 days, one neoarsphenamine 0.1 gm. intravenously as a provocative test. The subsequent tests were all negative.

In our results with the luetin test we found 26 doubtful and 3 positive out of 350 children tested. In all the doubtful and positive cases the tests were repeated. The Wassermann tests of all these cases were negative. (Table 7.)

An Abstract of the 3 children who gave a positive luetin reaction.

CASE 1. T. D., age 4½ years. Mother died of pulmonary tuberculosis. Physical examination, negative; no sign of congenital lues. Repeated Wassermans, negative. Von Pirquet, negative. Spleen not enlarged, epitrochlears not palpable.

CASE 2. E. P., age 4¾ years. Family history negative. General physical condition excellent. Mentally backward, chronic otitis for 6 months. Repeated Wassermanns, negative. Spleen and epitrochlears not palpable. Wassermann on mother, negative.

CASE 3. S. L., age 4½ years. Family history negative. Spleen and epitrochlears not palpable. Repeated Wassermann, negative. Wassermann on mother, negative.

Our results with the luetin tests have practically confirmed our negative Wassermann reactions except in 3 cases. Although many authorities believe that a positive luetin reaction is strongly presumptive of the presence of syphilis, our work does not corroborate this. The positive cases in our series showed absolutely no clinical signs or symptoms of lues, and therefore we agree with Blechmann[18] that positive luetin reactions may sometimes be obtained in the absence of syphilis.

As we have had an excellent opportunity to study the Wassermann results performed by 2 different laboratories on the same children, it might be worth while to compare them (Table 8). In all, 292 children were tested by both. Of this number, 201 were reported negative by the City and negative with both antigens by the State. Sixty-five were negative by the City and plus-minus (±) by the State. The remainder, which gave a

TABLE 7—CHILDREN SHOWING POSITIVE OR DOUBTFUL LUETIN REACTIONS.

Case No.	Age in Years	Luetin		Wassermann			
		1st	2nd	City	State A*	C**	
1	2	doubtful	doubtful	—	±	±	Mother insane.
2	1½	"	"	—	—	—	
3	1¾	"	"	—	—	—	
4	3½	"	"	—	—	±	
5	4¼	"	"	—	—	±	
6	2¼	"	"	—	—	±	
7	1	"	"	—	—	—	Illegitimate.
8	4½	"	"	—	±	±	Illegitimate.
9	4½	"	"	—	—	—	
10	5	"	"	—	—	—	
11	4	"	"	—	—	—	
12	3¼	"	"	—	—	—	
13	2¾	"	"	—	—	—	Mother insane.
14	3½	"	"	—	—	—	Illegitimate, malnutrition, Alopecia.
15	3¾	"	"	—	—	±	Deformed palate. Illegitimate, mother insane
16	2	"	"	—	—	—	
17	6	"	"	—	—	—	Mother insane.
18	2½	"	"	—	—	±	
19	2	"	"	—	—	—	Backward, spasmophilia. Convulsions.
20	4	"	"	—	—	±	Mother insane, exud. diath. vaginitis.
21	5	"	—	—	—	—	Chronic keratitis and conjunctivitis.
22	4	"	—	—	—	—	
23	4¼	"	—	—	—	—	
24	4	"	—	—	—	±	
25	2	"	—	—	—	—	Mother insane, illegitimate.
26	1¼	"	—				Mother insane, illegitimate. Rickets.
27	4½	+	+	—	—	—	Mother tubercular.
28	4¾	+	+	—	—	±	Backward, chronic otitis.
29	4½	+	+	—	—	—	

*Alcoholic
**Cholestrinized

positive or doubtful reaction by the first test by the City but became negative on repeated tests, were also negative by the State. One case was negative on 5 different occasions by the City and was ++++ (alcoholic antigen) and ± (cholestrin antigen) by the State, but on 2 subsequent tests negative reports were obtained. This is rather an unusual occurrence to have the alcoholic antigen more sensitive than the cholestrin. In general, the results of the Wassermann tests by the 2 laboratories have coincided very closely. This is not the experience of some observers who have found marked variations in the reports of the same specimen by different laboratories.

TABLE 8—COMPARISON OF CITY AND STATE DEPARTMENT OF HEALTH WASSERMANN TESTS.

	CITY						STATE					
No. of Cases	Test No. 1	Test No. 2	Test No. 3	Test No. 4	Test No. 5	Test No. 6	Test No. 1		Test No. 2		Test No. 3	
							A*	C**	A*	C**	A*	C**
170	—						—	—				
25	—	—					—	—				
55	—						—	±				
8	—	—					—	±				
6	—	—	—				—	—				
6	—						±	±				
1	—	—	—	—	—		++++	+	—	—	—	—
2	—						±	—				
4	±	—					—	—				
2	±	—					—	±				
8	+	—					—	—				
2	+	—					—	±				
1	+	±	—				—	±				
1	+	±	±				—	±				
1	++++	++	±	—	—	—	—	—				
1	++++	—	—	—	—		—	—				
2	++++	—	—				—	—				
295												

*Alcoholic.
**Cholestrinized.

(We wish to acknowledge our indebtedness to Dr. Alfred F. Hess for the privilege to report this study and for his helpful suggestions.)

SUMMARY.

1. A group of Jewish institutional children were tested for syphilis. They varied in age from a few days to 6 years, and were unselected. Many had a family history or pathological conditions which would warrant a suspicion of syphilis.

2. 830 Wassermann tests on 472 children were performed by the laboratories of the Department of Health of New York City, as well as that of the State. Without exception they proved to be negative.

3. 399 luetin tests were performed on 350 of these children. 321 reacted negatively, 3 positively and 26 were doubtful. The Wassermann tests on all children showing doubtful reactions were repeatedly negative. The 3 children showing positive luetin reactions showed at no time any clinical evidence of lues, and gave negative Wassermann reactions. The Wassermann tests on the parents of these children were likewise negative.

4. Among the children tested, 22.4 per cent. gave a history of insanity in one or both parents, 10.8 per cent. were illegitimate, 6.5 per cent. were mentally backward, 35.8 per cent. showed various pathological conditions. In spite of these circumstances, they all gave negative Wassermann reactions, a result which does not coincide with the reports of other workers.

5. Contrary to the general opinion regarding the incidence of syphilis in child-caring institutions, our results must lead us to conclude that among the children of the Jewish poor of New York City syphilis is an exceedingly rare disease.

REFERENCES.

1. Epstein, A.: Prager med. Wchnschr., 1913, Bd. 38, pp. 621-622.
2. Holt, L. E.: Amer. Jour. Dis. Child., 1913, Vol. 6: 166.
3. Elliot, W. M.: Glasgow Med. Jour., 1914, Vol. 71:339.
4. Steinert, C. and Flusser, E.: Arch. f. Kinderh., Nov. 2, 1915.
5. Blackfan, Nicholson and White: Amer. Jour. Dis. Child., 1913, Vol. 6:162.
6. Whitney, J. L.: Jour. A. M. A., 1915, Vol. 65:1906.
7. Jeans, P. C. and Buttler, Elsa, M.: Amer. Jour. Dis. Child., 1914, Vol. 7:327.
8. Jeans, P. C.: Amer. Jour. Syph., Jan., 1919, Vol. 3:114.
9. Lange: Jahrb. f. Kinderh., 1919, Vol. 90:83.
10. Wirtz, B.: Ztschr. f. Kinderh., July, 1919, Vol. 19:189.
11. Bolduan, and Koopman: Immune Sera, New York, 5th ed., 1915, p. 117.
12. Meyers, A. E.: Arch. of Ped., April, 1920, p. 225.
13. Cohen, M.: Arch. of Opth., 1912, Vol. 41:8.
14. Grulee, C. G.: Amer. Jour. Med. So., 1914, Vol. 168, p. 688.
15. Pussey, W. A. and Stillians, A. W.: Jour. of Cutan. Dis.
16. Kilgore, A. R.: Jour. A. M. A., 1914, Vol. 62:1236.
17. Hanes, F. M.: Amer. Jour. Med. Sc., 1915, Vol. 150:703.
18. Blechmann, G., and Delort, M.: Arch. de Med. des Enf., 1915, Vol. 18:197.
19. Corper, Gekler and Sweaney: Amer. Rev. Tuberc., 1917, Vol. 1:544.
20. Noguchi, H.: Jour. Exp. Med., 1911, Vol. 14:557.
21. Shenick: Jour. A. M. A., 1915, Vol. 65:399.
22. Lippman, H.: Muench. Med. Woch., Nov. 23, 1909.
23. Atwood, C. E.: Jour. A. M. A., Aug. 6, 1910.
24. McKay, W. H.: Ill. Med. Jour., 1913, Vol. 28:281.

A PRACTICAL CONSIDERATION OF THE INTESTINAL FLORA IN INFANTS.

By De Witt H. Sherman, M.D., and Harry R. Lohnes, M.D.
Buffalo, N. Y.

The bacteriology of the intestinal canal of the infant has been investigated from different viewpoints for a great many years. This study is instructive, because intestinal flora are the important factors in the functioning of the digestive tract under normal physiological conditions.

More recently these studies have been directed towards the types of intestinal flora and their influence upon the intestinal function. The correlation of these specific types to the chemical composition of the ingested food has been pretty definitely demonstrated.

It is a résumé of the present understanding of these types which prompts this paper. To Kendall, Torrey, Rutger, Porter and others we are greatly indebted for valuable information. Improved technic and the employment of new culture media have greatly aided their work.

A few basic principles of bacteriology are necessary for a better understanding of the processes going on in the intestinal tract. Bacteria are living organisms, and require food for heat, energy and growth. One type, the saccharolytic, thrives best on carbohydrate media. Another type, the proteolytic, thrives best on proteid media. Fats play an unimportant rôle in the determination of the types or the multiplication of the flora. It is claimed that they never initiate fermentation or putrefaction, but may increase either one.

The type which thrives best on carbohydrate media has acids for its end products of digestion. The type which thrives best on proteid media tends to produce an alkaline state. But this type may, through proteid digestion, produce proteid end products that are toxic, and if toxic products are produced and absorbed, they can be the cause of marked constitutional symptoms. Both of these can markedly influence the intestinal function.

The intestinal canal is a perfect incubator. All its conditions are favorable for the rapid growth and multiplication of its contained bacteria. These bacteria not only obtain their food supply from it, but they also excrete their waste products into it.

Intestinal bacteria, as a whole, can adapt themselves in quite a remarkable manner either to a proteid or a carbohydrate media. If grown upon a strict proteid medium, their ability to digest proteid is encouraged and gradually intensified, and they become intensely proteolytic. If, on the other hand, they are grown upon a carbohydrate medium, their ability to digest carbohydrates is encouraged and intensified, and they become active fermenters.

The most striking example of this adaptability is the colon bacillus. Some strains of colon bacilli have been identified which have lost their power to ferment sugars, but, if this same strain is taken and grown upon a sugar media, it will regain its lost function sufficiently to become an intense sugar fermenter.

Kendall says we must consider the intestinal flora as a whole, a physiological unit rather than a heterogeneous collection of bacteria.

In the nursing infant, whose food is composed of a relatively high percentage of milk sugar and a relatively low percentage of an easily digested proteid, we have a condition, frequently found, in which the whole intestinal tract is at all times permeated with sugar or its end products. In this nursing infant we find the ideal flora, aciduric in character, and dominated by the bacillus bifidus. The bacillus bifidus is found predominant only in the breast fed. It is a protecting flora and undoubtedly has a great effect in bringing about the relative freedom, which the breast fed infant enjoys, from gastrointestinal disturbances.

In an artificially fed infant, whose food is relatively high in proteid and has a variable sugar content, we find a flora, which more nearly approaches the adult type. In the upper bowel, with its more constant sugar content, we find an aciduric flora, dominated by the bacillus acidophilus. In the lower ileum or colon, with its markedly variable sugar content, we find a flora, the colon group, which will adapt itself either to the carbohydrate or proteid media.

By simple laboratory tests we can identify 3 types of flora: 1st, the fermentative flora; 2nd, the proteolytic flora; 3rd, the normal or facutative flora.

1st. The fermentative flora, grown upon carbohydrate media, will readily digest the carbohydrates with the formation of acids, but if grown upon proteid media, will not produce digestion or proteolysis. It is characteristically aciduric. As regards these fermentative flora, there should be a differentiation in the use of the term "aciduric" flora and "fermentative" flora. The former, the aciduric, never implies an excessive acidity, whereas the latter, the fermentative, does imply an excessive acidity. In the breast fed we find the ideal aciduric flora, dominated by the bacillus bifidus, while in the artificially fed, we have usually a mildly proteolytic flora. The ideal flora in the artificially fed would be an aciduric flora, dominated by the bacillus acidophilus.

The normal acid producing bacteria of the breast fed infant are the bacillus bifidus, especially, and the bacillus acidophilus. These, through cultivation, do not produce abnormal acid states or abnormal fermentative states. Such an abnormal state of acidity or fermentation demands the presence of other bacteria, such as the colon bacilli, or the bacilli Welchii.

2nd. The proteolytic flora will produce rapid digestion upon proteid media, but only a slight change upon carbohydrate media. The tendency of the bacterial metabolism of this type is strongly putrefactive.

3rd. The normal, or faculative flora are not excessively proteolytic or fermentative. As an example of this group, we have the bacillus coli, which is both fermentative or putrefactive, depending upon the media.

Can we associate clinical symptoms with an altered intestinal flora? Probably the most conspicuous and the most easily recognized condition is the so-called carbohydrate fermentation. Its symptoms, so commonly observed, are sour smelling, loose, acid stools, which excoriate and redden the buttocks. This condition is most commonly associated with a normal flora implanted upon an abundance of sugar. This provides a fertile soil for an excessive acidity, in reality a fermentation, due to the fermenters, the colon bacilli of the lower bowel.

Crystallizable sugars, such as cane, milk, malt sugar and glucose, have a double action. They act as cathartics through irritation and osmosis. Because they act as cathartics, if the dose is sufficiently large, they are hurried into the colon. Here the colonic flora, the colon bacilli, act progressively to ferment the sugars and to form acids. These acids, through irritation, further stimulate peristalsis. As a result of these 2 causes we have sour, loose stools. Having thus built up an excessively fermentative flora, the explanation is clear why a simple carbohydrate starvation for 24 hours does not always alleviate the condition. The more specialized this function has become, the longer it naturally takes to suppress it. Often this ability to ferment sugar applies to one particular form of sugar. By changing the kind of sugar, we may diminish the fermentation. As mentioned above, an excessive fermentation may be brought about by anything which will exaggerate peristalsis in the small bowel or interfere with the digestion and absorption of sugar. That is, the food may not contain an excessive amount, but the sugar, all there is of it, is thrown so rapidly into the colon, where it ferments, that we have the so-called dyspepsia with fermentation.

Dextrine and lactose are most active in increasing the bacillus bifidus and the bacillus acidophilus, particularly the latter. With their multiplication, the bacillus Welchii are apt to decrease.

On a carbohydrate diet, the intestinal flora are fermentative and occupy almost all the levels of the intestinal canal, but, with a mixed diet, the flora at different levels differ markedly.

Given a proper aciduric state, there will be a decrease not only of the bacillus Welchii and the proteolytic flora, but also a decrease in the gas-producing flora, dominated supposedly by the streptococcus.

The symptoms associated with proteolytic flora are now receiving the most attention by investigators. Test tube experiments show that the end products of proteid digestion are often toxic. As an example, it has been shown that a toxic albumose has been identified as the cause of intoxication in bowel obstruction. Further, it has been shown, that vasomotor depressants have been identified as one of the end products of imperfect proteid digestion. This latter explains the vasomotor symptoms so often prominent in proteid intoxication.

The adult intestinal intoxication, or autointoxication, has been debated for years. Metchnikoff recognized the altered flora developed in this condition, and attempted to correct them by implanting a fermentative organism, the bacillus bulgaricus. The bacillus bulgaricus has been cultivated for years in milk, but has never been isolated from the fecal flora. This is so because it could not be expected to readily adapt itself to a new media and new surroundings. In recent years, more was expected from the bacillus acidophilus, a natural habitant of the bowel.

It is generally conceded that little can be accomplished by feeding living cultures, such as the bacillus bulgaricus or bacillus acidophilus. *Results can only be obtained by changing the character of the food to one upon which the intestinal bacteria grow.* An increase of the carbohydrates, sufficient to give a plentiful supply in the colon at all times, is necessary to encourage the acid forming bacteria.

In the adult, it is often a long-drawn-out process to alter the type of the intestinal flora dietetically, because the existing type has become so firmly fixed. Often the effort is doomed to failure. On the other hand, in the young babe, the type of flora has not become so firmly fixed, and it can therefore readily respond to a change of food. This fact has been recognized for many years by pediatricians and has been applied by them in gastrointestinal conditions.

Foods differ in their ability to encourage an aciduric or a proteolytic flora. Of the carbohydrates, it has been found that dextrin most readily converted a proteolytic to an aciduric flora. Milk sugar stands next. Maltose, saccharose and dextrose have only a moderate ability, while most starches have a very feeble effect.

Wheat bread, because of its dextrin content, has the ability to develop the bacillus acidophilus to 90 per cent., even 95 per cent., of the flora of the intestinal tract and can crowd out all other bacteria except the streptococcus. If, on the other hand, one wishes to use a carbohydrate without particularly increasing the bacillus acidophilus, one can secure this result by using rice. The converse is also true, that rice does not inhibit the development of the proteolytic flora as does wheat.

As regards proteids, meat readily establishes a proteolytic flora. Casein and fish establish it with greater difficulty. Vegetable proteids have little or no effect. Because proteolytic or putrefactive processes are most marked in the ileum, this explains why carbohydrates are required to produce a combating flora, and also why the colon washes are of no avail to influence a process too high up to be reached.

Morse, Porter and others have recently directed attention to conditions associated with proteolytic flora in children. In older children, the symptoms resemble so closely those seen in the autointoxication in adults, that they will not be discussed.

To Porter and his co-workers, we are indebted for a classification of symptoms due to *proteolytic flora.* We have used this classification at the Children's Hospital for the past year, have followed his technic, have checked up his findings, and have found it most useful in suggesting the line of treatment of our cases.

His classification is as follows: 1st, a mild type; 2nd, a fulminating type; 3rd, a grave chronic type; 4th, a putrid diarrhea in infants.

The mild type corresponds to the state Czerny calls "milk injury." Finkelstein calls it "disturbance of balance." Before we knew anything about intestinal flora, clinical experience had taught us that these cases very readily and very promptly responded to the addition to the diet of dextrin as present in malt soup or dextrinized starch.

The fulminating type present symptoms of sudden profound intoxication without diarrhea. This is a type of case which is most perplexing because of its failure to present a cause of proper ratio to the seriousness of the symptoms, the underlying condition often not being appreciated.

The grave more or less chronic type occurs in older children, 10 to 20 months old, there being frequent stools, progressive loss of weight, etc.

All these 4 types of cases have a flora which is *intensely proteolytic,* as shown by laboratory tests, and are types of cases not infrequently unrecognized. Improvement is most quickly and most surely noted when there is an alteration of the flora from the proteolytic to the fermentative type.

What has interested us most during the past summer has been the type of flora accompanying the infectious diarrheas. At the outset, the flora are usually mildly proteolytic. During the course of the disease, we have noted that, if we adhered to a very strict proteid diet, the stools have become foul smelling, that symptoms of proteid intoxication have manifested themselves, and that the flora, upon cultivation, have showed marked proteolysis.

Should we then, in these cases, use a strict carbohydrate diet, or a strict proteid diet? Both lines of treatment have their advocates, and both claim success. From laboratory tests, and from results of clinical experience, it has been shown that carbohydrates are indicated in such cases. But the amount of sugar must be carefully regulated, because, if too much is given, it is thrown by the exaggerated peristalsis too rapidly into the colon. There the process may be carried too far. Only enough sugar is needed to lessen the proteolysis, but not enough to be acted upon by the colonic flora and produce acids. For, should acids be produced, they will stimulate the existing exaggerated peristalsis, and by increasing the number of stools, increase the water loss. This water loss is already of serious consideration in these cases. On the other hand, by withholding the carbohydrate too long, we favor the development of a proteolysis, which might add to the intoxication.

It would then seem reasonable to expect that the best results could be obtained if we used a mixed diet, from which the irritating or fermenting sugars were omitted. We have used with excellent results skimmed lactic acid milk diluted with dextrinized gruel. In this mixture both the proteid toxic end products and the carbohydrate fermentation are avoided as far as possible. The proteid of the diluted lactic acid milk is not in sufficient amount to encourage proteolysis. The fermentation of the carbohydrates is controlled in 2 ways, (a) the organisms which exhibit unusual intestinal activity do not, as far as known at the present time, thrive in the presence of lactic acid; and (b) the dextrinized gruels, which are the carbohydrates by choice, are non-irritating and are not readily fermentable.

Either of these 2 elements can be increased or decreased, depending upon the character of the stools. If the stools become acid, the gruels are decreased and lactic acid milk increased. If, on the other hand, the stools become foul smelling, the lactic acid milk is decreased and the dextrinized gruel is increased.

In this brief paper we have not attempted to discuss in detail all the various phases of intestinal bacteriology. We have attempted to bring out a few pertinent facts, which have aided us greatly in the feeding of infants and in the treatment of their gastrointestinal disturbances.

SUMMARY.

1. Bacterial end products are either harmless acids, or are split proteid products, which are often toxic in nature.

2. The infantile flora differ from the adult flora in that the type has not become fixed. Thus it can readily adapt itself to a change of food.

3. Through improper feeding the type may become either excessively fermentative or excessively proteolytic. These types can be differentiated by culture media, and are often associated with clinical symptoms.

HABITUAL VOMITING IN INFANTS (Jahrbuch für Kinderheilkunde, Berlin, 1920, 93, No. 6). Epstein comments on the peculiarly large air content of the infant stomach, both with breast and bottle feeding. Another feature of the infant stomach is the lack of the ability to contract the stomach concentrically around the food. This peristole seems to be a reflex function and there seems to be some parallel between the size of the air bubble and this peristolic function. For these and other reasons he gives a more solid gruel instead of the usual fluid food in case of habitual vomiting. This seems to elicit the peristole reflex, and this expels the air. Even a small amount of a more consistent food, immediately before the ordinary feeding, starts the peristolic reflex as a conditional reflex. Two or three teaspoonfuls of a thickish gruel are given five minutes before the feeding. Even breast milk can be concentrated to form the more solid food required for the purpose. In 9 of the 36 children thus treated the vomiting ceased at once; in 22 the vomiting gradually subsided in the course of from 3 to 10 days. In 2 of the cases no effect was apparent and atropin was given. As the vomiting stopped, the children began to thrive at once. This treatment has the special advantage for the breast fed that the breast feeding can be resumed. In conclusion he says that this peristolic functioning of the stomach is not the only factor, probably, in habitual vomiting; the diaphragm may be involved, but this treatment with *breivorfütterung* is certainly worth a trial.—*Journal A. M. A.*

CLINICAL DEPARTMENT

Cases Contributed by
Charles Herrman, M.D., New York
W. O. Colburn, M.D., Lincoln, Nebr.
Harold R. Mixsell, M.D., New York

Case No. 19.* Female, 13 years old.

Cases of congenital heart disease associated with marked dwarfism are comparatively rare. In a series of 62 cases of congenital heart disease recently reported by Weber, only one was associated with as marked dwarfism as the following case.

The parents of H. K., 13 years of age, are healthy; they have been married 23 years, and were both 43 years of age at the time the patient was born. She is the youngest of 7 children. With the exception of one child, who is not quite as strong as she should be, all the children are healthy and of normal physical and mental development. The mother has had no miscarriages or still-births. As far as is known there is no cardiac disease or congenital anomaly in other members of the family. The patient was born at full-term, the delivery was non-instrumental. She was small, but not cyanotic. She was breast fed for 8 months, and began to walk at 2 years of age. She has always been small for her age, and not quite as strong as the other children. At 5 years of age, she was taken to a physician on account of a cough, and the congenital heart lesion was recognized at that time. She began to go to school at 6 years of age, and is now in Class 7A. so that her mental development is normal. She has had an occasional cold, but none of the other infectious diseases of childhood. She is able to walk long distances without tiring, and can go up a flight of stairs slowly without becoming short of breath or cyanotic. The appetite is fair, the bowels regular. She has not begun to menstruate. The patient is markedly undersized (Fig. 1). Her weight is 49.5 pounds. This corresponds to that of a child of 7 years, the normal for her age being 91 pounds; height, 48.5 inches, corresponding to that of a child of 8 years; circumference of the head, 20 inches; chest, 23.5 inches; abdomen, 21 inches; length of the upper extremity, 21

---

*A Case of Dwarfism With Congenital Heart Disease.
Read at the Annual Meeting of the American Pediatric Society, June 2, 3, 4, 1921.

inches; lower extremity, 28 inches. The patient is not cyanotic, the fingers are not clubbed, but the hands are somewhat cool. The examination of the chest shows a normal condition of the lungs. The apex impulse is felt in the fifth intercostal space, just outside of the nipple line; there is no thrill. Percussion of the cardiac area shows enlargement of the heart, especially the right, and an increased area of dullness in the second intercostal space to the left of the sternum. On auscultation a loud systolic murmur is heard over the entire cardiac area, loudest at the third intercostal space to the left of the sternum; it is very well transmitted into the vessels of the neck on the left side, but poorly transmitted to the back. The roëntgenologic examination (Fig. 2) shows an enlargement of the heart, especially the right. The

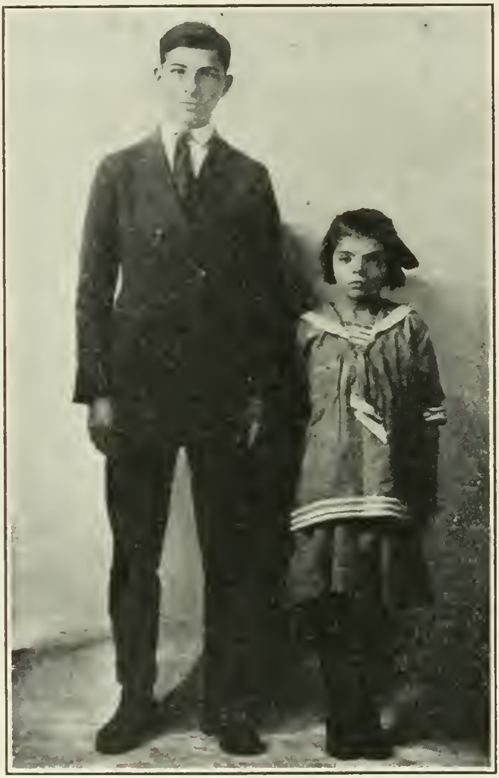


Fig. 1. H. K., 13 years and her brother, 15 years of age.

ossification centers are apparently normal. The examination of the blood shows 90 per cent. hemoglobin, and 5,136,000 red blood cells.

Discussion. The diagnosis of the exact nature of the lesions present in congenital heart disease is extremely difficult. It is usually safer to diagnose simply congenital heart disease, with the probable presence of one of the commoner lesions, namely, a defect in the ventricular septum, or pulmonary stenosis. Several lesions may be present, and even at the post-mortem examination their exact nature may be difficult to determine. In this case, the absence of cyanosis, even on exertion, the absence of dyspnea and other subjective symptoms, the point of maximum intensity of the murmur in the third intercostal space, and its transmission into the vessels of the neck on the left side, make the presence of a defect in the ventricular septum with an open ductus arteriosis probable.

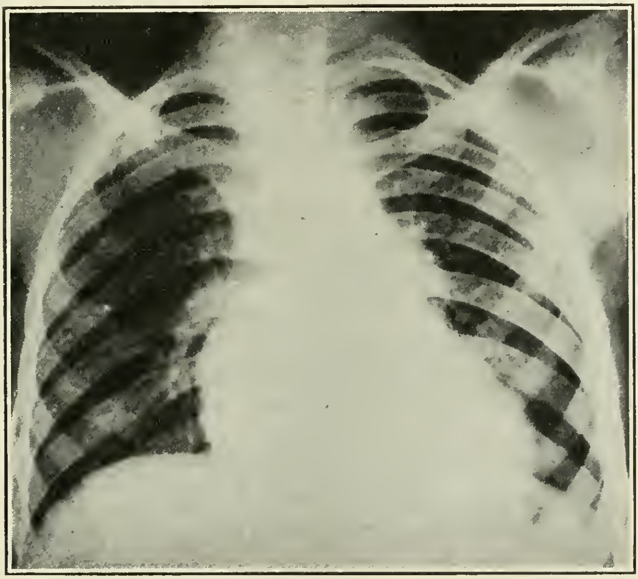


Fig. 2. Roentgenogram of H. K. showing enlargement of the heart, especially to the right.

Almost all cases of congenital heart disease show some retardation in growth, but usually it is not marked. The weight averages from 10 to 15 per cent. below the normal for the age. A reduction of nearly 50 per cent., as in this case, is rare. As one would expect, the patients with marked cyanosis usually show more retardation. It is therefore all the more surprising that the dwarfism should be so pronounced in this child, notwithstanding the fact that there is so little disturbance of the circulation. Although the physical examination shows no lesions in other organs, it is not unlikely that some other factor, possibly some other congenital anomaly, is responsible for the marked retardation in growth.

CHARLES HERRMAN.

CASE NO. 20.* Male, 22 months old.

Allen defines diabetes as a specific deficiency of the power of assimilating food. It is a condition of persistent glycosuria rarely seen in childhood and differing from the same affection in adult life by rapid wasting and a speedy fatal ending. In the past, diabetes has been considered the result of a diminished functional capacity of the islands of Langerhans, and even at the present time, the weight of opinion is on the side of some pancreatic disturbance. How erroneous this supposition may be, we are certain that the normal person may ingest a quantity of food considerably in excess of his energy requirement and completely assimilate all that is digested and absorbed, even though the greater part of the food be carbohydrate. With diabetes or impaired pancreatic function, the organism becomes incapable of assimilating even such quantities of carbohydrate as are contained in a general mixed diet, that is to say, a diet sufficient to cover the energy requirement in which form ½ to ⅔ per cent. of the total caloric intake, is in the form of carbohydrate. With this diminished pancreatic function, glucose accumulates in the blood, and when a certain limit is reached, the excess of glucose overflows through the kidneys. At this point we are confronted with the question of dealing with a true diabetes or the so-called renal diabetes, or glycosuria. In this type of cases the patient passes sugar in the urine, when the blood sugar concentration is normal or even below normal. The condition is unaccompanied by polyuria, polydipsia, and polyphagia. The amounts of sugar excreted in the urine are seldom large, and bear but little relation to the carbohydrate intake. A normal or low blood sugar content, coincident with glycosuria, is suggestive of an increased permeability of the kidney for sugar, and may not be a true diabetes.

---

*Diabetes Mellitus in a Child of 22 Months.

Family History. Father has had glycosuria for a number of years. A prominent local internist says he does not think he has a true diabetes. Mother and older sister are in good health. The sister is about 14 years of age and very obese.

Past History. Instrument delivery, breast fed for 11 months and developed normally, both mentally and physically. December 10, 1919, the little patient had a tonsillitis. Cultures grew streptococcus of a rather long chained variety. The following day both ear-drums were reddened with a maximum temperature of 102⅘°.

Dec. 12. Ears clearing. Maximum temperature 104⅖°.

Dec. 13. Urine examination—negative.

Dec. 13 to 16. Temperature ranging 100° to 104°.

Dec. 16. Urine examination showed a slight trace of sugar. Dr. H. M. McClanahan of Omaha saw the case in consultation on this date. It was believed that the sugar might be thrown down because of toxemia.

Dec. 17. Trace of sugar.

Dec. 18. Trace of sugar.

Dec. 18. Swelling at lower end of right femur. Dr. Orr was called and immobilized the extremity.

Dec. 19. Left shoulder began swelling.

Dec. 22. Urine—.4 per cent. sugar.

Dec. 23. Slight systolic murmur at apex.

Dec. 24. .15 per cent. sugar in urine.

Dec. 25. .0 sugar.

Dec. 30. Dr. H. W. Orr opened left shoulder, finding a periostitis of upper end of humerus and suppuration of axillary glands.

Jan. 4, 1920. Dr. Orr opened right knee—periostitis of lower end of right femur.

Jan. 5. Slight trace of sugar—none since Dec. 24.

Jan. 6. Slight trace of sugar.

Urine was examined daily up to January 24, 1920, inclusive, and no more sugar appeared.

Present Illness. Patient brought to my office September 27, 1920, having been apparently in excellent health since January 24, 1920, with the exception of a diarrhea for a few days previous to this visit. A specimen of urine was obtained and sugar was found. The table gives the urinary and blood findings as they have been determined from time to time.

Date	Sp. Gr.	24 Hr. Amt.	% Sugar	Sugar Gms.	Diacetic Acid	Acetone	NH3	Urea	Blood Sugar
9-27-20	——	——	Trace	——	0	——	——	——	
9-28-20	——	——	00	——	0	——	——	——	
9-29-20	1025	384 c.c.	.13	0.5	0	0	.26	3.84	
10- 6-20					0				.18
10- 8-20	1022	592 c.c.	0.13	0.71	0	0	.28	10.656	
10- 9-20	1020	480 c.c.	0	0	0	0		7.2	
10-10-20	1024	512 c.c.	0.277	1.43	0	0	0.38	12.29	
10-11-20	1022	540 c.c.	0.2	1.08	0	0	0.2717	11.34	
10-12-20	1024	540 c.c.	0.15	0.81	0	0	0.22	11.34	
10-13-20	1026	450 c.c.	0.125	0.5625	0	0	0.26	13.5	
10-14-20	1025	480 c.c.	0.135	0.658	0	0	0.2938	13.44	
10-15-20	1024	555 c.c.	0.155	1.443	0	0	0.15	9.98	
10-17-20	1020	600 c.c.	0	0	0	0		9.00	
10-18-20	1026	550 c.c.	0.125	0.6875	0	0	0.464	12.1	
10-19-20	1022	600 c.c.	0.104	0.62	0	0		8.1	
10-20-20	1024	480 c.c.	0	0	0	0	0.274	8.64	.069
10-21-20	1020	540 c.c.	0	0	0	0		10.53	
10-22-20	1015	600 c.c.	0	0	0	0		5.4	
10-23-20	1015	540 c.c.	0	0	0	0		8.1	
10-25-20	1020	600 c.c.	0	0	0	0		8.1	
10-26-20	1022	540 c.c.	0.143	0.77	0	0	2.57	10.53	
10-27-20	1023	600 c.c.	0.1	0.6	0	0		9.0	
11- 8-20	1025	480 c.c.	0.125	0.5	0	0	0.274	2.7	.1688
11- 9-20	1020	600 c.c.	0.125	.75	0	0	0.388	14.4	
11-27-20	1026	420 c.c.	0	0	0	0	——	11.34	
1-14-21	—	——	——	——	——	——	——		.202

Progress. On regular diet—the next day no sugar was found. The third day, on usual diet, 0.13 per cent. sugar. A 500 caloric diet, in which the protein and fat are approximately equal to each other, grain for grain, was given as follows:

Breakfast: 1 egg, 50 gm.; bacon, 40 gm.

Dinner: Broth, 150 c.c.; steak, 40 gm.; vegetables (5%), 200 gm.; butter, 5 gm.

Supper: Broth, 150 c.c.; steak, 40 gm.; vegetables (5%), 200 gm.; butter, 5 gm.

Total protein, 40.4 gm.; fat, 31.0 gm.; carbohydrate, 12. The next day urine, sugar-free. A 1000 caloric diet given.

Breakfast: 2 eggs, 100 gm.; bacon, 50 gm.; butter, 5 gm.

Dinner: Broth, 150 c.c.; steak, 100 gm.; vegetables (5%), 200 gm.; butter, 10 gm.; (olive oil, 10 gm.).

Supper: Broth, 150 c.c.; steak, 100 gm.; vegetables (5%), 200 gm.; butter, 10 gm.; (olive oil, none).

Total protein, 71; fat, 71; carbohydrate, 12.

Back to No. 1 for 3 or 4 days, permitting gluten bread.

Urine clear at October 17, 1920.

Diet No. 2 one day, back to No. 1, October 20, 1920; sugar free. Diet No. 2 and up to diet No. 3, 1500 calories.

The report of this case was presented for discussion before the Nebraska-Iowa Pediatric Society held at Lincoln November 11, 1920. Most pediatrists present were inclined to believe that this case was not a true diabetes. It was believed by some that the pituitary gland might be a factor, because of the oversize of the older sister.

I have used the anterior portion of the gland for some time, with the results that the child looks better, better color, and seems to be in perfect health. The sugar persists, however, in traces almost daily. A communication from Allen states that the case is an unusually interesting example of diabetes following definitely upon an infection, which reached the blood stream from a local focus, and which set up metastatic trouble in the joints and presumably also in the pancreas together. He further states that he believes that this is a case of true diabetes, and in the end will prove fatal.

At the present writing, January 15, 1922, the little patient is progressing favorably, seems in excellent health, shows sugar more than half of the time in traces. The parents are very cautious about the diet. I have not been able to keep in close touch with the case, because the child seems so normal.

W. O. COLBURN.

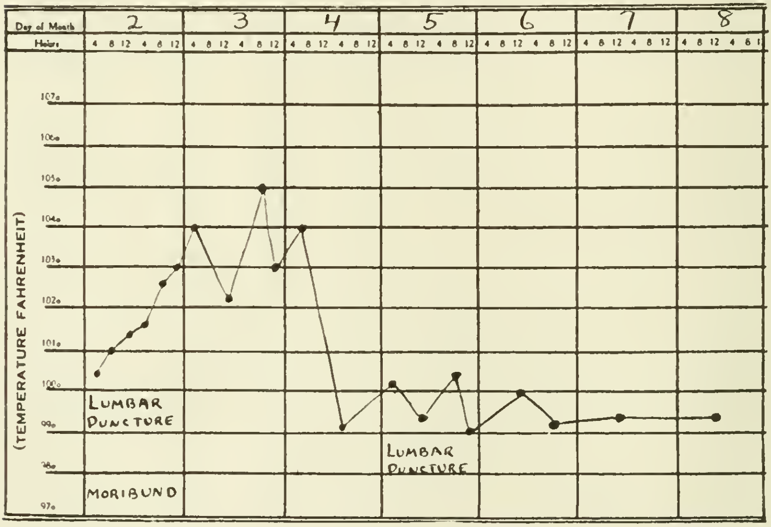
CASE NO. 21.* Male, 4 years old.

John, aged 4 years, was admitted to my service at the Willard Parker Hospital on November 2, 1921. He was an ambulance case and was brought in with a diagnosis of diphtheria made by an outside doctor. Just how long he had been sick could not be ascertained on admission. He was in a moribund condition with a temperature of 100.4°, respirations 55, and a weak and thready pulse of 140.

---

* A Case for Diagnosis.

Examination showed a pale, fairly well-nourished boy with no signs of diphtheria. There was, however, a faint faucial reddening. The only positive physical signs obtainable were a slight rigidity of the neck and a doubtful Kernig. There was also slight bleeding from the mouth; the pupils were dilated and did not react to light; knee jerks were present; and there was no Babinski, Brudzinsky's or Oppenheim's signs. Shortly after admission he had a convulsion which lasted about 2 minutes. On account of the rigidity of the neck and the Kernig, a lumbar puncture was done, and 40 c.c. of clear fluid, under marked pressure, was obtained. Examination of this fluid showed a cell count of 210, with 70 per cent. polymorphonuclears, and 30 per cent. lymphocytes. There was a positive globulin reaction with a reduction of Fehling's solution. The temperature, pulse and respiration rose rapidly (see chart), the temperature reaching 105° on the next day, the pulse 160, the respiration 50. There were no further signs and he still remained in a semi-comatose condition. He was fed by gavage, and whiskey, strychnin and caffein sodio-benzoate were given as stimulants. The temperature, pulse and respiration remained up until the morning of the 4th, when they all dropped



by crisis, the temperature to 99.4°, where it has remained ever since. At no time were there any signs of pneumonia; there was no cough and the case was distinguished by its comparatively negative findings. The white blood count was 9000 with 73 per cent. polys; on the 6th, 9200, with 59 per cent. polys. On the 5th, on account of slight persistent rigidity of the neck, another lumbar puncture was done and 40 c.c. of clear fluid under moderate pressure was obtained, with 200 cells, 68 per cent. polys. With the subsidence of the temperature, pulse and respiration, the boy rapidly improved. He was a trifle hazy in his mind until November 6th, 2 days after the temperature drop, and since then has been perfectly normal. He is not lethargic and there are no paralyses. The fluid taken on November 8th was negative, cell count being 5.

Comment. On admission a tentative diagnosis of poliomyelitis, bulbar type, was made on account of the spinal fluid findings. Other suggestions made at the time were encephalitis lethargica, or a meningismus caused by a possible pneumonia without signs in the chest, or an influenzal infection. The recovery is so rapid that it is hard to fit it into a definite category, although it might readily have been the termination of a pneumonia.

This emphasizes the importance of eliciting a careful history which in this case it was impossible to get.

HAROLD R. MIXSELL.

WHOOPING COUGH (Médecine, Paris, Aug., 1921). E. Weill has been proclaiming since 1894 that whooping cough is contagious above all in the premonitory period, and becomes less and less contagious until there is no further contagion in at most two weeks after the onset of the whoop. Whooping cough in the service never spread as the children with it are not brought to the hospital until the spasmodic cough develops, and by that time the contagious period is past. No contagion occurred among 104 children tested by the closest living in contact with 26 whooping cough children. Some of these children during the years since have contracted whooping cough elsewhere. One month of isolation from the very first coughing is ample for prophylaxis, he reiterates.—*Journal A. M. A.*

SOCIETY REPORTS

THE NEW YORK ACADEMY OF MEDICINE.
SECTION ON PEDIATRICS.

Stated Meeting, Held May 12, 1921.

Miner C. Hill, M.D., *in the chair.*

Tuberculous Meningitis Recovered.

Dr. D. S. Byard presented this patient. He stated that reports of the recovery of cases of meningitis, presumed to be tuberculous, were not infrequent in the literature, 63 such cases having been reported in the last 5 years, in 5 of which the evidence of a tuberculous type of the disease was acceptable.

This case was admitted to St. Mary's Hospital in October, 1918. Family and personal history negative. The child was ill 9 days before admission. For the first 5 days there was evidence of upper respiratory infection. Four days preceding admission there were fever, nervous and mental irritation, head retraction, pain on being touched, and an indisposition to move. Temperature was 102°. Pneumonia developed at the right apex which cleared up in 10 days. Several blood counts averaged 12,000 white cells, 65 per cent. polymorphonuclears and 35 per cent. lymphocytes. The urine was negative. The child ran a temperature for 5 weeks. During the first 2 weeks she was in a state of nervous exaltation and at times delirious. Later she became stuporous, semi-conscious. There were constantly head retraction, exaggerated reflexes with positive Babinski, Kernig and Brudzinski. Irregular temperature 100°-103°. The von Pirquet reaction was slightly positive. Four lumbar punctures were made. The first, made on the evening of her admission, showed a clear spinal fluid without much pressure. There was a slight lymphocytosis. No bacteria were found. The spinal fluid on November 20 and 28 showed relatively large numbers of tubercle bacilli. The slides taken at this time were exhibited. These slides had been passed upon by 4 different pathologists as showing undoubted tubercle bacilli. The clinical symptoms were those of a typical tuberculous meningitis. She was discharged cured on January 21, and has since been in increasingly good health. Subsequently the von Pirquet reaction had never been positive; both the dermal and intracutaneous tests negative. X-ray practically negative. Increased peribronchial exudation in early plates. The speaker said he would anticipate the evidences first, of recovery, the negative von Pirquet, the lack of evidence of tuberculous lesions as being against the diagnosis, but affirmed as one of real tuberculous meningitis because of the undoubted findings in the spinal fluid, typical clinical course of the disease, and the fact that the present negative tuberculous reactions were not incompatible with a previously existing lesion which was actually cured. The pathological condition doubtless was a meningitis associated with a local single tubercle.

TUMOR OF BRAIN IN BOY FIVE YEARS OLD.

Dr. H. L. Flowers presented this case from the Vanderbilt Clinic. He stated that the child complained of headaches which grew progressvely worse. In January, he began to vomit, the vomiting being projectile in type. He came under observation at the Clinic in February, when he showed very few symptoms, except that he knit his eyebrows and had a slight strabismus and slow pulse (60). In addition, the kneejerks were slightly exaggerated and there was slight nystagmus. Ophthalmological examination showed a choked disc on both sides. The Wassermann reaction was negative and the von Pirquet reaction was negative. A spinal tap showed the spinal fluid under pressure but there was no evidence of increase in the cells. Culture was negative. An x-ray, taken in the antero-posterior position, showed erosion of the sella. The radiologist thought that perhaps there was a tumor of the pituitary. Pituitary extract was administered and was followed by vomiting. When the pituitary was discontinued the vomiting ceased. It was found, however, that he vomited regardless of whether pituitary was given or not. At the present time he was in about the condition described, except that in the last few weeks there has developed an increasing ataxia and unsteadiness of gait, with tendency to fall to the right side; the strabismus is also very much more marked.

LYPODYSTROPHY.

DR. G. R. IRVING presented this case. (See ARCHIVES OF PEDIATRICS, November, 1921, page 743.)

A CASE FOR DIAGNOSIS.

DR. MAY G. WILSON presented this patient—a young colored girl, 14 years of age, born in the West Indies. The father and mother and 2 sisters, younger than the patient, were apparently well. The patient was born at term and the labor was normal. She had pneumonia in 1919 and during her illness the cardiac condition was noted. She was of average mentality and good habits. She was referred to the cardiac clinic. She stated that she played all the games that the other girls played and that she could take 4 flights of stairs. She was a well developed girl of normal weight and height for her age. The pulmonary second sound was accentuated and there was a loud rough systolic murmur transmitted upward to the vessels of the neck. The pulse was regular, 75 to 85, the blood pressure was systolic, 160 to 180, diastolic 116 to 122, at rest. Physical examination did not disclose any other findings. The x-ray shadow showed the heart enlarged to the right and left and a moderate aortic enlargement. The Wassermann was negative; the von Pirquet negative, and the urine normal. She could not stand the average exercise tests. There was no history of rheumatism or lues. The condition was doubtless congenital arterial hypertension. The case made one wonder how many cases of hypertension had their beginning in childhood.

FOUR CASES OF CONGENITAL HEART DISEASE FROM BELLEVUE HOSPITAL.

DR. HERBERT B. WILCOX presented these 4 patients who were selected from a group of such cases which had been under observation for some years, in the wards and out-patient department.

Two of them illustrated the wide difference in physical signs and symptoms, both cardiac and general, which may be observed in different individuals suffering from apparently the same lesion —apparently—because definite diagnosis of congenital lesion is frequently impossible.

The boy, 5 years of age, cyanotic, dyspneic, totally incapacitated, with an extreme clubing of fingers and toes, has a compensatory hypertrophy of his blood represented by a red cell count of 8,600,000, and a hemoglobin of 140 per cent. Yet, in spite of these striking objective symptoms, we find his heart not enlarged, and presenting only a short soft, early, systolic murmur at the third left space, without thrill. His lesion cannot be diagnosed by auscultation, but from the general physical indications seems to be plainly a severe grade of pulmonary stenosis.

In contrast is the second boy of 12 years, although slight and under weight (52 pounds), has suffered no physical handicap from his heart condition, he has no cyanosis or dyspnea, and lives a practically normal life. On the other hand, examination of his heart reveals a marked thrill, a harsh systolic murmur, audible all over the precordium; maximum at left base, and considerable embarrassment of heart action. His hemoglobin is 90 per cent., the red cells 4,600,000.

Two other children, one with multiple lesion and much disturbed heart action, the other with a simple patent ductus, are shown to illustrate the point that congenital heart disease, in severe or mild form, may not be altogether incompatible with normal growth and development.

The boy, 12 years of age, has been under observation for 5 years, and has made normal advance in growth, weighing now 84 pounds. He attends school, and suffers only slight discomfort on exertion. His hemoglobin is 80 per cent., his red cells 4,500,000. His physical signs are those of pulmonary stenosis, patent septum and ductus, and in addition he presents murmurs difficult to interpret, but which might well arise from pericardium or mitral valve.

The girl of the same age is in no way incapacitated by her cardiac condition. Her weight is 64 pounds, her hemoglobin 94 per cent., her red cells 4,200,000. Excepting for the characteristic murmur of the patent ductus arteriosus, she is normal physically.

Congenital heart disease may be many times not incompatible with normal life. This does not depend upon the type of lesion as shown by direct examination of the heart. The murmurs heard are of less diagnostic and prognostic importance than is the general condition of the child.

CONGENITAL HYDRONEPHROSIS.

DR. HERMAN MARTINSON presented this specimen. He stated that this boy, 5 years of age, came to the Vanderbilt Clinic complaining of swelling of the abdomen. The mother stated that he was born with a harelip which was operated upon when he was 9 months old. She stated that following the operation he was always troubled with a dribbling of urine and was never able to pass a straight stream. The swelling of the abdomen had been diagnosed as gas distention. Because of the dribbling, it was thought that the swelling might be caused by dilatation of the bladder and he was catheterized. About 40 ounces of urine were obtained. The pyelogram showed a dilated urinary tract. The ureters were as large as a small intestine, the pelves of the kidneys were greatly dilated, but the bladder was smaller than normal. The child died possibly as the result of the thorium used in pyelographing and on autopsy the condition shown in the x-ray was exposed. There was no retention of nitrogenous substances in the blood. There was no calculus found nor any stricture present at any point. The condition classifies itself as one of functional atony of the smooth musculature of ureter and bladder with consequent failure to be emtpied physiologically, because of the lack of proper impulse and tone.

STATUS LYMPHATICUS, SPECIMENS FROM TWO CASES.

DR. F. E. JOHNSON presented these specimens from the service of Dr. Bartlett at the Babies' Hospital. He stated that the specimens were taken from 2 children who died of status lymphaticus. The one child was 20 months of age and was interesting in view of the family history. The mother had had 14 children, 9 of whom had died. Seven of the children died within a week or two after birth. This child had a very large thymus, weighing 35 or 40 grams, and died of bronchopneumonia. The second one died after being in the hospital 2 or 3 hours. This child was 2½ months of age. The case history showed that the child had had 3 convulsions, one early in the morning, one later, and one in which the child died. The interesting point he made was that children rarely died in convulsions unless they were suffering from status lymphaticus.

TWO CASES OF MYOSITIS OSSIFICANS, WITH X-RAY DEMONSTRATION.

Dr. L. T. Le Wald gave this demonstration. He stated that the x-ray plates showed extensive involvement of the lumbar muscles, the pectorals and in the region of the psoas on each side down into the muscles of the groin, there being extensive deposits of lime salts. The patient was a male child, 9 years of age. The case had been worked out by Dr. Sayre at the New York University Clinic. On one occasion the boy was standing in a doorway of a dwelling and appeared to be very rigid. Someone came along who thought he was fooling and knocked him over, apparently fracturing one of the calcified muscles.

The second case was that of a female child, 4 years old. The distribution of the calcareous deposits were very similar to those in the first case but not so extensive.

GAUCHER'S SPLENOMEGALY—A FAMILY GROUP OF FOUR CASES.

Dr. H. N. Appel presented this paper. (To be published in a later issue of Archives.)

CONGENITAL MALFORMATION OF THE ESOPHAGUS.

Dr. W. C. A. Steffen stated that congenital malformation of the esophagus, according to some authorities, was exceedingly rare, yet Brennemann, in 1913, reported 3 cases seen within a year, and stated that the fact that the patients were just babies and the principal symptom was vomiting, which all babies were supposed to do more or less, would lead one to believe that many cases were not recognized.

Seventy per cent. of malformations of the esophagus belonged to that type in which there was congenital atresia, the upper portion of the esophagus ending in a blind pouch. From this there extended a fibrous or muscular cord to the lower part of the esophagus. The lower part connected by a fistulous opening with the trachea at its bifurcation or with one of the bronchi and then continued down in a normal manner to the stomach. The case herein reported belonged to this group. The explanation of these malformations was found in the arrest and perversion of the development of the esophagus and trachea. The clinical picture was fairly definite. The infants were apparently healthy and took the breast or fluid readily. After a minute or two they became cyanotic and stopped breathing, and regurgitated. Usually there was a frothy discharge from the nostrils and mouth due to inability to swallow the secretions. Brennemann called attention to the diagnostic value of a distended stomach in ascertaining the presence of a tracheo-esophageal communication in these cases. Inanitation fever usually set in about the third day. In the reported case there was no rise in temperature until the evening of the fourth day. The urine was scanty and early suppression was seen. The infants usually had a few meconium stools. Pneumonia of the right lung was a common terminal condition. Death usually took place in from 7 days to 2 weeks due to inanition when the condition was not recognized, drowning when persistent attempts were made to feed by mouth, or pneumonia. Surgical treatment had been attempted, but in view of the condition with which one was dealing and the present state of surgery, it was probably wiser to follow the dictum of Brennemann and let the infant die in peace.

The present case was that of a female infant of healthy parents, born March 15, 1921. The family history was negative except that the father's sister had one child with spina bifida and cleft palate. One other child in the patient's family was alive and well. There was a history of one still birth at 7½ months. The fetus was said to have been macerated. This infant weighed 6 pounds, 7 ounces, and was apparently normal. On attempting to feed the child, the symptoms above referred to as characteristic of this condition manifested themselves. An attempt to feed the child through a tube showed that a tube could be passed only 4 inches from the lips; the water given by the tube was regurgitated. A bismuth suspension was given and x-ray pictures taken. They showed the esophagus ending in a blind pouch at the base of the first rib. The child died on the tenth day.

At autopsy, terminal gangrene of the face, buttocks, toes and finger tips was observed. There was a lobar pneumonia of the right lung. The larynx, trachea, esophagus, and stomach were removed. A 12 French catheter passed into the esophagus through the cardia, appeared in the larynx. Another catheter passed through the upper end of the esophagus was stopped in a blind pouch. On dissection this pouch, which apparently was the upper end of the esophagus, was found to be posterior to the trachea and about 1½ by ½ inches in extent. From the lower end a fibrous cord passed downward posteriorly to the trachea and joined the esophagus at the bifurcation of the trachea. The esophagus at this point anastomosed with the trachea. The mucous membrane of the esophagus and trachea were continuous. The diagnosis was congenital atresia of the esophagus with communication at the cardia. The pathological sections of the liver and kidney showed no noteworthy pathological changes.

SARCOMA OF THE KIDNEY—OPERATION WITH RECURRENCE OF SARCOMATOSIS.

DR. N. R. NORTON presented this specimen from the Babies' Hospital. He stated that the specimen that was taken was a colored child, 20 months of age, brought to the hospital in August, 1920. The child had a large mass in the right side extending beyond the median line about one inch. The history was negative except that the family had observed the mass for about 6 months. It was evidently a neoplasm of the kidney. Dr. Bolling removed it through the usual lumbar incision. The tumor measured about 8 x 7 inches; it was 14 inches in circumference around the long axis and 13½, around the short axis. No blood could be found in the urine. Following the operation, the temperature went to 105°. The child then made a perfectly uneventful recovery and left the hospital 2 weeks after admission. The child was readmitted 7 months later. She had gained 4 pounds. She looked fairly well for 1 or 2 weeks and then began to run a little temperature. The mother had noticed an enlargement in the upper part of the abdomen. Physical examination was otherwise negative except that the blood showed 17,000 leucocytes. There were no chest signs. The large mass in the abdomen was continuous from the free margin of the ribs to below the umbilicus. It then went off under the ribs towards the axillary line on the left side. It was a large smooth mass. The patient was in the hospital 5 days. Two days before death, her temperature went to 102°, and then to 105°. The growth was an embryonal cell sarcoma, which had metastasized through both lungs, so that there was scarcely any normal lung tissue. Autopsy showed a bronchopneumonia. Until 48 hours before death there were no symptoms of metastases in the lungs.

POLYMYOSITIS. X-RAY PICTURES.

DR. SARA WELT-KAKELS showed x-ray pictures of polomyositis which she had reported in the literature, and called attention to certain differences between myositis specificans and polymyositis. Myositis specificans was a congenital disease frequently associated with drawfism, and involved the thorax particularly. Polymyositis always involved the skin. Recovery sometimes took place in polymyositis but not in myositis specificans. Dr. Kakels reviewed briefly the history of her 2 cases of polymyositis, one of which recovered.

A CASE WITH HOOKWORM INFECTION.

DR. JULIUS ARNOWICH presented this patient. He stated that hookworm disease in New York and its environs was quite rare. The cases that one did see occurred in people who had migrated here from localities in which the condition was endemic. It had been estimated that 90 per cent. of the natives of Porto Rico harbored infection produced by the uncinariae.

The patient was 7 years of age and had lived in Porto Rico until 11 months ago. His chief complaint was diarrhea of 5 years standing and intermittent fever, worse during the past 2 months. The father and 2 brothers were alive and well. His mother had been troubled with chronic diarrhea for many years. As far as the boy's history was concerned, no medical or surgical diseases were recorded. The history of his present condition dated back to the age of 2 years when he had a severe attack of diarrhea accompanied by frequent vomiting spells. No blood was noted in the stools. From the age of 3 years until 2 months ago he had occasional severe diarrheal attacks but was comparatively comfortable during this period. In February, 1921, he was admitted to an asylum. From that date on his attacks of diarrhea recurred and became persistent. During the 24 hours he would have 4 to 8 loose, watery, and at times, malodorous stools. Vomiting had been a feature of his condition for only 2 weeks.

Physical examination showed the patient dull, apathetic, poorly nourished and somewhat underdeveloped. He weighed 34½ pounds, and his height was 43 inches. There were signs of stomatitis; his gums were infected but did not bleed. No petechiae were noted. There was a shallow ulcer at the tip of the tongue about 7 mm. in diameter. The lips were dry. The oral involvement was painful to the touch. The tonsils and pharynx were negative. The submaxillary, submental and parotid lymph glands were visibly enlarged. The anterior and posterior cervical and axillary glands were small and discrete and felt like bird shot. The heart and lungs were negative. The abdomen was distended, the superficial veins standing out prominently. The liver and spleen were not palpable. Knee jerks were not obtained. There were areas of pigmentation on the arms, forearms, hands, buttocks, thighs and legs. There was no evidence of involvement of the osseous system. The laboratory findings showed the Wassermann, urinalysis, von Pirquet, and Schick tests negative. The x-ray examination showed infiltration of the left apex. No tubercle bacilli were found in his sputum. His red blood count was normal; the white blood showed 11,800 leucocytes, the differential count showing 52 per cent. polynuclears, 1 per cent. transitionals, 2 per cent mononuclears, 41 per cent. lymphocytes and 3 per cent. eosinophiles. The hemoglobin was 80 per cent. The average pulse rate was 110; respiratory rate 28; temperature 99.5°. Examination of the stools showed no evidence of blood. The ova of the uncinaria, the trichocephalus dispar and the trichomonas intestinalis were found.

Dr. Arnowich said he reported the case because a question had been raised regarding the cause of the malnutrition. Those in favor of this diagnosis pointed to the close resemblance of the cutaneous, oral and gastrointestinal signs found in this case with those found in pellagra, moreover the season of onset and the close confinement indoors for 2 months were points in favor of pellagra. Because of the glandular and x-ray findings, tuberculosis had been suggested. Personally he was inclined to believe that the intestinal parasites explained the clinical picture.

THE PHILADELPHIA PEDIATRIC SOCIETY.

Stated Meeting, Held February 8, 1921.

EDWARD B. HODGE, M.D., PRESIDENT, *in the Chair.*

ABNORMAL METABOLISM IN INFANCY AND ITS RELATIONSHIP TO SYMPTOMATOLOGY.

DR. W. MCKIM MARRIOTT, M.D., of St. Louis, delivered the Annual Frederick A. Packard Lecture, in which he pointed out that the metabolic processes of the infant are essentially the same in character as those of the adult but are relatively much more active. Hence, all of the organs of the body concerned with the utilization of food are constantly working at much nearer their limits of capacity than in the case of older individuals. The margin of safety is small and when any of the organs are overtaxed by excessive demands made upon them, or when their functional capacity is decreased, even though only temporarily as the result of infection or other influences, the course of metabolism may be profoundly altered. The course of metabolism may be abnormal when there is either an excessive or insufficient intake of food or when there is a diminished functional capacity of the organ systems concerned with metabolism.

He took up the clinical picture resulting from the over-feeding of milk, especially cow's milk, which has been described by various authors under the names of "milchnarschaden," "bilanzstőrung," "chronic fat indigestion," or "fat constipation." The chief characteristics of the condition are the fact that despite a large intake of milk the infant fails to gain in weight, the stools are ordinarily few in number, light colored and alkaline; a large portion of the solid material consists of calcium soaps of the higher fatty acids, chiefly palmitic and stearic with a considerable amount of calcium phosphate also present. He showed by metabolic studies that the loss of fat in the form of unabsorbed soap is entirely insufficient to explain the symptoms. Further, if a small amount of fat is added to the diet to compensate for the loss by way of the bowel, it tends to aggravate the symptoms even when the total amount of fat absorbed is actually increased by this means. Again, administration of calcium and magnesium salts to make up the loss in the stools has not generally been followed by any degree of success. It has been suggested by Steinitz that the loss of base by the bowel might result in a condition of acidosis. However, the symptoms of these infants are not those of acidosis and alkali fails to benefit the condition. He ruled out excess of protein as being the cause of this condition, as infants suffering from this condition do very well when fed on buttermilk, a mixture containing practically the same amount of protein as whole cow's milk. In all of these explanations the chemistry of the metabolism has been considered but the physical chemistry of the metabolism has been disregarded.

The condition under consideration occurs almost exclusively in infants fed on cow's milk. Cow's milk has a slightly higher hydrogen-ion-concentration than breast milk but the difference is very slight. A much greater difference is seen in the way in which cow's milk acts when treated with acid as compared with breast milk treated with the same amount of acid. If sufficient acid is added to an ounce of breast milk to bring it to a certain degree of acidity, it will take 3 to 6 times as much acid to bring cow's milk to the same degree of acidity. Hence, cow's milk, although slightly more acid than breast milk, possesses a much higher alkali reserve or "buffer" value.

The first step in the digestion of milk as it enters the infant's stomach is acidification which serves to make rennin action possible, inhibits the growth of bacteria and to some extent to regulate the pyloric reflex. Furthermore, when the acid gastric contents are emptied into the duodenum formation of secretin occurs with the resultant stimulation of the flow of bile and pancreatic juice. Dr. L. P. Harshman and Dr. Marriott made observations on the acidity of the gastric contents at the height of digestion, which showed that when infants were fed on undiluted cow's milk the acidity was less than 1/10 of that occurring in the stomach after a meal of breast milk. This explains why the processes of digestion and metabolism are interfered with at the very start. Moreover, they found that infants suffering from digestive disturbances almost invariably had a lesser acidity of gastric contents than did normal infants.

That the buffer substances in the milk are important factors in leading to the disturbances of metabolism is indeed true. If cow's milk is well diluted and the caloric value made up by the addition of carbohydrate, we have a mixture of low buffer value. If cow's milk is artificially soured by lactic acid organisms, the buffer substance is largely neutralized. Such mixtures as these are very effective in the treatment of the condition. Condensed milk in the dilutions usually fed has a very low buffer value due in part to changes brought about by heating and in part to the dilution of the milk which is invariably great. Protein milk on account of its content of acid and its low whey content is also very low in its buffer value. They have determined that in the infant's stomach such mixtures as have been described act towards acid in a manner closely approximating breast milk.

If overfeeding with cow's milk is continued for too long a period, especially if excessive amounts of sugar are added to the diet, diarrhea instead of constipation is the result. Under these circumstances the stools become acid in reaction, green, and contain considerable amounts of mucus. Dr. Marriott believed that bacterial decomposition of the food in the gastrointestinal tract was perhaps the most important factor in bringing about diarrhea. He showed that acid fermentation in the intestine may be a result as well as a cause of infantile diarrhea. The products of digestion of the ordinary foodstuffs have no significant peristalsis stimulating effect in the intestine unless decomposed by bacterial action.

With the exception of bacillary dysentery, a recognized specific disease (infectious), the types of microörganisms found in the stools of infants suffering from severe or even fatal diarrhea are usually not essentially different from those of the normal breast fed infant. Examinations of the bacterial flora of the upper intestine have given more definite information. Moro and Tissier have shown on autopsy material, that the upper intestinal tract of infants dying from severe diarrhea usually contains many organisms largely of the coli group, whereas, the intestinal tracts of infants dying from causes other than diarrhea are relatively bacteria free. Bossert and Bessau have demonstrated in infants suffering from diarrhea that there is invariably an invasion of the duodenum with such organisms as b. coli and b. lactis aerogenes. organisms ordinarily present only in the lower intestine. Koessler and Hanke have shown that a strain of b. coli isolated from the stools may, when grown in the presence of an excess of sugar, quantitatively convert the amino-acid histidin, a product of the digestion of protein, into histamine, a substance which Mellanby has found capable of causing vomiting and severe diarrhea when administered by mouth. This explains how an organism such as the b. coli, which is relatively harmless in the large intestine where its substrat is not such as to allow of the production of toxic substances, may become harmful when transplanted to a portion of the intestine where conditions are favorable for the formation of substances capable of doing harm.

Hot weather and fever produce a distinct diminution of the gastric juice. When the secretions of the stomach and intestines are decreased from any cause, digestion and absorption of food is slow and bacterial growth especially favored by lack of the antiseptic action of the secretions. Diarrhea, however brought about, may, if sufficiently prolonged or severe, lead to a grave disturbance of the metabolism, which is largely the result of an excessive loss of material by way of the bowel. The protein loss in the stools may be 2 or 3 times as great as in health. In severe diarrhea, as much as 87 per cent. of fat taken in may be lost in the stools (Jundell). Absorption of sugar is undoubtedly diminished in diarrhea and if starch is fed considerable amounts may appear unchanged in the stools. We have no accurate information as to the loss of vitamines, bile pigments and salts, though a loss of each of these substances must occur during severe diarrhea. The total mineral loss by the bowel is very great and often exceeds the intake, sodium, potassium, magnesium and chlorides being chiefly concerned. The loss of the chlorine ion is proportionately greater than that of either sodium or potassium so that the end result is a loss of acid rather than of alkali by the bowel.

The loss of water in diarrheal stools is more marked than that of any other constituent, it may be as much as 15 times as great as under normal conditions (Jundell). This loss of water threatens the water reserve of the body and is an important factor in producing deep seated changes in the intermediary metabolism. The urine of these infants is markedly diminished in volume; there may be almost anuria. It is highly concentrated. The organic nitrogen excreted by the urine and the bowel not infrequently exceeds the nitrogen intake, resulting in a negative nitrogen balance;

he most striking changes are an excess of ammonia and aminoacid nitrogen. Acetone bodies may occur in the urine but are no greater in quantity than in the urine of normal infants during a period of underfeeding. In almost all severe cases there are small amounts of glucose with or without traces of lactose or galactose.

The blood is concentrated as the result of water loss; this brings about a diminished peripheral circulation, diminished blood volume, and, as shown by Czerny, an apparently incomplete diastolic filling of the heart. Fever is a frequent occurrence.

Finkelstein, Langstein and Meyer attributed the symptoms mentioned to a poisoning of the body by sugar especially lactose, and the great water loss as secondary to salt loss. The fever is explained on the basis of a specific pyogenic action of lactose and of mineral salts. Allen, Helmholz, Sansum and Woodyat and others have been unable to show any specific toxic effect of either lactose or sodium chloride when injected into the circulation in any but overwhelming amounts and in concentrated solution.

Dr. Marriott clearly showed that there is direct experimental evidence that a water deficit in the body (anhydremia) can account for the entire picture presented by these infants who following a severe diarrhea, have lapsed into a toxic-like condition with grave disturbances of the metabolism. In the light of our present knowledge, it seems more reasonable to assume that water loss is the important factor in these infants and that the harmful effect of an excess of food, especially of sugar, is due to the fact that it leads to an increase in the diarrhea and consequently to water loss from the body. When anhydremia has existed for any length of time such serious injury to the body cells takes place that recovery may be impossible even if the lost water is restored. If, however, in diarrhea, the water loss can be checked soon enough and sufficient water and mineral matter supplied to the body, recovery may be expected.

Metabolic Disturbances Due to an Insufficient Intake of Food. Dr. Marriott described the picture of the starved or marasmus type of infant, calling attention to the lowered resistance to infection of all kinds. Apparently these infants are always hungry but when fed suitable amounts of food for normal infants vomit and develop severe diarrhea. This condition is brought about by a preceding prolonged diarrhea.

Metabolism in Athreptic Infants. This condition is brought about by repeated attacks of diarrhea; it is seen also in infants underfed for long periods or in those suffering from chronic infections, it is especially frequent in prematures and in those living under unhygienic surroundings. This condition may be properly considered as the end result of partial starvation continued for long periods of time. There is a negative mineral salt balance and when the condition is fully developed there may also be a negative nitrogen balance, indicative of body tissue destruction. There is a diminished functional capacity of the body to oxidize organic material and the basal energy metabolism of athreptic infants is often high as compared with those who are normal. The destruction of body substance is not confined to the solid portions of the organism but affects the blood as well. There is a diminution in blood protein, a destruction of blood corpuscles and a decrease in the total blood volume resulting in a diminished blood flow which brings about a lowering of the functional capacity of all parts of the body. When the blood volume is increased there is a return of normal function.

The treatment of athrepsia consists in supplying a food containing all of the essentials necessary for building up body tissue and one which will have at the same time a sufficient caloric value to cover the high energy needs; 150 or 200 calories per kilo or more may be needed. The capacity of these infants to utilize food may be increased by restoring the blood volume by either transfusion or intravenous injection of a solution of glucose and gum acacia. Athreptic infants may have stationary weight for long periods of time despite a fairly large intake of food. This stationary period or "period of repair," seems to be the time during which the functional capacity of the body for utilizing food is returning. In these athreptic infants breast milk is our standby. When this cannot be obtained mixtures of whole lactic acid milk with added sugar, preferably in the form of dextrin and maltose, are well tolerated.

Tetany or Spasmophilia. The term tetany is here used to include all manifestations of the so-called spasmophilic diathesis, namely carpopedal spasm, laryngismus stridulus, convulsions, characteristic hyperexcitability of nerves to mechanical and electrical stimuli, etc. The parathyroid glands of infants dying with tetany have sometimes shown anatomical changes but such findings have not been constant, nor has any single dietary factor been brought into relationship to the condition, though it is more active at certain periods of the year and in artificially fed infants. During active tetany there is usually observed a decreased calcium retention, diminished calcium content of the blood and of certain organs, notably the brain, which returns to normal during the stage of convalescence. This lowered calcium content is not due to a lack of calcium salts in the diet. There seems to be failure of the body to absorb and retain such calcium as available. However, when sufficient amounts of calcium salt, especially calcium chloride, are given these infants by mouth suffering with tetany to increase the blood calcium to an amount approximating the normal, the manifestations of tetany invariably disappear. Dr. Marriott gave evidences showing the development of tetany is coincident with the fall in blood calcium. In infantile tetany there is an excretion of considerable amounts of guanidin and methyl-guanidin. In the treatment of tetany, administration of calcium salts in sufficient amounts results in the disappearance of all manifestations of the condition. Calcium salts cannot be administered parenterally and the administration by mouth results only in a slow increase in the calcium content of the blood. Magnesium has in many respects a similar physiological reaction to calcium and may be given subcutaneously or intramuscularly in the form of magnesium sulphate in fairly concentrated solution. The symptoms of tetany promptly disappear and if calcium salts are administered by mouth for a considerable period of time following this, the symptoms of tetany do not reappear.

MONGOLIAN IDIOCY (Médecine, Paris, Aug. 1921). J. Comby has observed that the mongolian imbecile is often the last child of a large family, the mothers physically exhausted or worried. Hence this type of idiocy is rare in countries with a low birth rate. He gives thyroid extract systematically in all such cases, and has noted decided benefit from it although nothing like the miracle in myxedema.—*Journal A. M. A.*

ARCHIVES OF PEDIATRICS

FEBRUARY, 1922

HAROLD RUCKMAN MIXSELL, A.B., M.D., Editor

COLLABORATORS:

L. Emmett Holt, M.D.	New York
W. P. Northrup, M.D.	New York
Henry D. Chapin, M.D.	New York
Francis Huber, M.D.	New York
Henry Koplik, M.D.	New York
Rowland G. Freeman, M.D.	New York
Walter Lester Carr, M.D.	New York
C. G. Kerley, M.D.	New York
L. E. La Fétra, M.D.	New York
Royal Storrs Haynes, M.D.	New York
Herbert B. Wilcox, M.D.	New York
Charles Herrman, M.D.	New York
William H. Donnelly	Brooklyn
Frank H. Richardson	Brooklyn
Edwin E. Graham, M.D.	Philadelphia
J. P. Crozer Griffith, M.D.	Philadelphia
J. C. Gittings, M.D.	Philadelphia
A. Graeme Mitchell, M.D.	Philadelphia
Charles A. Fife, M.D.	Philadelphia
H. C. Carpenter, M.D.	Philadelphia
I. A. Abt, M.D.	Chicago
William P. Lucas, M.D.	San Francisco
R. Langley Porter, M.D.	San Francisco
E. C. Fleischner, M.D.	San Francisco
Fritz B. Talbot, M.D.	Boston
Oscar M. Schloss, M.D.	Boston
Maynard Ladd, M.D.	Boston
Charles Hunter Dunn, M.D.	Boston
Henry I. Bowditch, M.D.	Boston
Richard M. Smith, M.D.	Boston
L. R. De Buys, M.D.	New Orleans
Robert A. Strong, M.D.	New Orleans
John Foote	Washington
Joseph S. Wall	Washington
B. K. Rachford, M.D.	Cincinnati
Henry J. Gerstenberger, M.D.	Cleveland
Borden S. Veeder, M.D.	St. Louis
Frederick W. Schlutz, M.D.	Minneapolis
Julius P. Sedgwick, M.D.	Minneapolis
William Weston, Jr., M.D.	Columbia, S. C.
A. D. Blackader, M.D.	Montreal
Edmund Cautley, M.D.	London
G. A. Sutherland, M.D.	London
J. D. Rolleston, M.D.	London
J. W. Ballantyne, M.D.	Edinburgh
James Carmichael, M.D.	Edinburgh
G. A. Wright, M.D.	Manchester

PUBLISHED MONTHLY BY E. B. TREAT & CO., 45 EAST 17TH STREET, NEW YORK.

ORIGINAL COMMUNICATIONS

THE IDEAL WEIGHT OF CHILDREN.

By James J. Putnam, M.D.

Boston, Mass.

The rate of growth in the human is greatest during the first year of life and gradually diminishes as a child grows older. The greatest gain in weight is made during the first 5 to 6 months of life, when a normal infant doubles its birth weight. During the second 6 months, an infant gains approximately the same amount of weight that it gained during the first 5 or 6 months but, whereas the increase in weight during the first 5 to 6 months is 100 per cent., in the second 6 months of life it is about 50 per cent. During the second year of life, it diminishes to approximately 25 per cent., and in the third year, it is less than 20 per cent.

There is also a similar proportional decrease in the gain in body length, or height, with increasing age. There is an increase in length of approximately 21 per cent. during the first 6 months, 14 per cent. during the second 6 months of life, and correspondingly less as the child grows older. Normally there is an increase of 61 to 64 centimeters in length during the first 6 years of life, or about 43 per cent. of the length at birth. Between the sixth and twelfth year of age, there is an increase of 25½ to 28 centimeters in length, which is an increase of about 20 per cent. of the height at 6 years.[1]

There are many factors which affect growth, the most important of which are nationality, environment and social status, physical defects and the quantity and quality of the food. The social status influences the quantity and quality of the food, and also determines to a large extent the medical care which a child receives.

Influence of Nationality on Growth. Certain nations are known to be tall and well developed, while other nations are characteristically short. The Anglo-Saxon race, and certain races of Chinese, in fact groups of people in different parts of the world, are pronouncedly taller than their neighbors; the Japanese, on the other hand, are a characteristic example of the shorter nations. Even in Japan, there are localities where the people are much taller than the general run of the inhabitants. A superficial comparison of the data from different countries reveals the fact that the growth curves for different races of men, or even for similar races inhabiting different localities, are by no means identical. A growth curve constructed from measurements of children in one country, therefore, could not be legitimately used as a standard with which to compare children of another country and probably not for those living in different climates of the same country. For example, it has been found that the infants of London, both male and female, average much higher in weight than those of Leeds, England. It would, therefore, be necessary to establish standards for different countries and probably for sub-divisions of the same countries, if averages were accepted for a basis of comparison. The writer believes that averages should not be used as the goal up to which undernourished children shall be brought, but that instead an ideal should be the goal. Before recording the data, he wishes again to emphasize different factors which may influence growth. A large part of this summary has been taken from a careful review of the subject by Benedict and Talbot[2] in their study of "Growth and Metabolism from Birth to Puberty."

Environment and Social Status. It has been shown by various authors that environment and social status play a part in the growth of children. Those children who live out of doors and whose family can afford to supply them with good and sufficient food, obtain better growth than children of the same nationality and locality who have not the same social opportunities,[3]. As early as 1829 Villermé[4] concluded that, all other things being equal, stature is greater and growth sooner completed where the country is richer and the comforts of the inhabitants more general. Robertson[5] recently confirmed this, for he found that, as the environment became more uncomfortable, there was a corresponding diminution in weight and stature. He also notes that as the environment becomes poorer, medical care extended to the children decreases as indicated by the percentage of adenoids removed. This medical neglect is shown by the great increase in numbers of un-removed, infected adenoids and tonsils, in under-nourished children.

Food and physical surroundings are not entirely responsible for under-nourishment. It has been shown that physical defects play a large part in preventing the normal growth and nourishment of children even with the best food and environment. Carious and infected teeth, enlarged and infected tonsils and adenoids, are the most common physical defects responsible for under-growth and nourishment. Continuous infection prevents normal development.

Exercise. An under-fed child, in many instances, automatically restricts the out-put of heat, that is, the energy used up in work or play, to a lower level to provide for growth while other children, who are led on by excitement of competition with their play-mates, although they grow in height, "run themselves thin." In the first instance the lack of growth is due to an inadequate supply of food and, in the latter, to excessive exercise without the extra food necessary to compensate for the increased muscular activity. If such a child is made to rest during the day, it will commence to gain weight on a normal diet, without increasing the quantity of food.

Fluctuations of Height and Weight During Day and Night. Camerer,[6] studied the daily fluctuations in weight of children and later Mallinghansen[7] studied the 24 hour fluctuations in height and weight of boys from 13 to 16 years of age. They both found that there was an increase of weight and a decrease of height during the day and an increase in height and a decrease in weight during the night. These observations showed a fluctuation of one kilogram in weight during the day in a youth of 17 years, and a fluctuation of .65 kilograms during the day in a boy of 8 years, while in an infant there may be a drop in weight of .2 kilograms during the day. Both writers also found seasonal fluctuations in weight but were unable to explain them.

Weight of Clothing. Nearly all charts in common use at the present time give the weight of children over 5 years of age with clothes on. Griffith[8] studied the weight of clothing of children during the first 5 years of life. He found that the approximate absolute weight of clothing at different periods with relation to the gross normal body weight was as follows:

Age	Weight of Clothing (Pounds)	Ratio to Weight of Normal Child Dressed. (Per Cent.)
Birth to 3 months	1¾	16
3 to 6 months	1¾	11
6 to 9 months	1¾	10
9 to 12 months	1¾	8
1 to 2 years	2	8
2 to 3 years	2	6
3 to 4 years	2	6
4 to 5 years	2¼	6
5 years	2½	6

When the children were divided into different sexes he found that the relation of weight of clothing to gross weight by sex to be:

Age	No. of Cases		Average Weight of Clothing				Ratio of Weight of Clothing to Normal Gross Weight.			
	Boys	Girls	Boys		Girls		Boys %		Girls %	
Yrs.			oz.	gm.	oz.	gm.	oz.	gm.	oz.	gm.
2	15	15	29	870	31	930	5.79	..	6.56	..
3	21	8	30	900	31	930	5.15	..	5.47	..
4	12	18	33	990	39	1170	5.02	..	6.03	..

Bowditch[9] found that the total weight of clothing at 5 years was 2.8 pounds or 6.45 per cent. of the gross weight for boys, and 2.84 pounds, or 6.79 per cent. for girls; at 8 years, 4 pounds or 7.23 per cent. for boys, and 3.5 pounds or 6.54 per cent. for girls; at 11 years, 6.7 pounds or 9.88 per cent. for boys, and 4.9 pounds or 6.88 per cent. for girls; and at 14, 8.1 pounds or 8.15 per cent. for boys and 7.5 pounds or 6.76 per cent. for girls. It would seem, therefore, that the absolute weight for the clothing for girls at these ages is less than that for boys.

Schmid-Monard[10] weighed the clothes of a large number of children and concluded that the weight of clothes from 3 to 6 years of age was 7 per cent. of the weight of boys and 6 per cent. of the weight of girls, and from 6 to 14 years, 7.75 per cent. of the weight of boys and 8 per cent. of the weight of girls. These ratios are apparently the relation of the weight of the clothing to the weight of the children undressed.

Any close observer of children knows how open to error body weights with clothes are. It is only necessary to empty any small boy's pockets to convince one that weights with clothes are unscientific.

Growth—Its Relation to Seasons. In most children the gain in weight is slowest during the summer months, and usually greatest in the autumn. Bleyer[11] summarizes his obesrvations on periodic variations in growth as follows: "First, periodic variation in the rate of growth, consisting of an accelaration from midsummer to late fall, a retardation in winter and greater retardation in spring and early summer, was found to exist among infants. Second, this would not appear to be due to change of diet. Third, weight gains in the first year of life were greater in summer and fall than in winter and spring and in the second year of life the best gains were made in August, from which it would not appear that heat has a retarding effect upon the rate of growth, but may even favor it."

During almost every illness the gain in weight ceases and there is usually a loss depending upon the severity of the sickness. The loss is always much more rapid and greater in disease of the gastrointestinal canal than in other forms of illness.

Food and Height. Practically all our knowledge of the relation between food and height has been obtained from observations made by the American investigators, Osborne, Mendel, McCollum, and others on white rats. These important studies have shown that the presence of the so-called food accessory substances are necessary for normal skeletal growth. Osborne and Mendel[12] were able, by dieting, to suppress growth for prolonged periods, and, subsequently by supplying the proper foods, to cause white rats to attain normal growth without apparent impairment of the individual, thus proving that the growth impulse, or capacity to grow, may be suppressed for a time and exercised later at a period far beyond the age at which growth usually ceases. They were also able to show that the period of growth may be greatly prolonged by inadequacies in the diet so that growth becomes slow without being completely stopped. Jackson[13] found that although different organs in the body did not maintain their normal relative weight during inanition, after the proper food was given they resumed their natural growth and attained adequate size despite the early stunting. Retarded growth, therefore, does not necessarily mean that the hope of attaining perfect adult form and function is lost; on the contrary, when organic disease is absent, there is every reason to believe that there will be proper restitution on a correct diet.

When the total energy is deficient it results, first, in restriction of activity, and, second, if the energy is still insufficient, as shown by Waters,[14], there will be long continued skeletal growth without gain in weight. Hence it seems as if, in the long run, children, unless frightfully under-nourished, and woefully deficient in the food accessory substances, will have a reasonable normal skeletal growth with increasing age. Consequently the best index of growth is age to height. If height is not up to the age then we may reasonably assume that food accessory substances are deficient. If the weight is too low for the height, we may look, other factors mentioned above being excluded, for a deficiency in the caloric intake. A child may also be undernourished when there is excessive exercise and only enough food for the average amount of activity, in other words, if he "runs himself as thin as a rail."

The recent interest in malnutrition has necessitated a standard from which to judge whether a given child falls into the class of malnutrition or not. A study of the various tables commonly used shows a great divergence in what may be considered normal weight and height.

The figures previously published are deficient in 2 respects: First, there are very few figures for the pre-school age, and, second, there are very few figures for the naked weights of children over 5 years. We have attempted to fill both these vacancies. Until a few years ago, it was customary to give the average weight and height for a given age without regard to the height-weight ratio. But as Holt[15], Retan[16] and others have shown, there is a normal variation in height of several inches for children of the same age. It is manifestly unfair to call a well nourished boy 40 inches tall under-weight because the whole group of boys of his age average 44 inches in height and are proportionately heavier.

In 1917 H. Gray and K. M. Gray[17] after a careful review of the literature, were only able to find 2 tables, those of Crum and Wood, drawn up on the age-height-weight basis. F. S. Crum[18] presents figures for naked children from 6 months to 4 years of age, based on a study of 5602 boys and 4821 girls who were "weighed and measured according to uniform rules and in the main by physicians and nurses, or other special qualified persons." He considered that his children represented an unusually well cared for group and that his averages were probably rather higher than would be found in the rest of the country. The other table drawn up by T. D. Wood[19] in 1910 was based "primarily on our statistics on several thousand boys and girls in the Horace Mann School, the largest private non-sectarian school in the United States."

Holt[20] charted the figures of various observers on a weight for age basis and found that there were wide variations among American boys of the same age, and even wider ones when boys of different races were included. The same thing was true of the age-height ratio, but not to such a marked degree. He regrouped the children on a weight for height basis and found that the curves plotted in this way followed nearly the same course except that in short races the growth is slower and stops earlier. The ratio made by dividing the weight in kilos by the height in centimeters shows a steady increase from 5 to 18 years. Just before puberty there is a slowing up in growth. The variation in height and weight is more marked as the children grow older. In a later article[21] he draws attention to the fact that there is greater variation in the weight of children the nearer they approach the adult type, when they take on the characteristics inherited by them.

The figures presented in this paper were taken from 2 groups of healthy white children, (A), 2331 boys and 2295 girls varying in age from 2 weeks to 7 years, who were weighed and measured without clothes under the direction of Dr. Anna Rude of the Children's Bureau, Department of Labor, Washington, D. C., during the health campaign in Gary, Illinois, and surrounding towns, and are published through the kindness of Dr. Anna Rude, and (B), a group of 510 boys and 167 girls taken from the private schools in and within 100 miles of Boston. This latter group appears under the title of private school children, Benedict and Talbot[2]. The authors considered that these children were living in the best surroundings under careful medical supervision, and ought, therefore, to attain ideal growth. They were all given a careful physical examination and only those who were considered normal, clinically, were included. When these boys were compared to the Crum-Wood group, the Schmidt-Monard group and Holt's private school boys, it was found that they were distinctly taller and heavier for their age, but a little lighter for their height. In discussing what may be considered the average, the normal and the ideal growth of children, the authors say, that "the fact that a group of 100 private school children may attain a height for age considerably above that of the average, or so-called normal, can be taken only as an index of the fact that this average represents children living under conditions which do not produce the best growth," and that the higher figures represent an ideal which has been reached in certain parts of our American population and an ideal that might be striven for by the remainder which has not yet reached it. The children were grouped on the age-height-weight basis as is shown in Tables I and II. The age in years is shown by the abscissae and the height in inches by ordinates, and at their intersection the weight in pounds and ounces. Children of 3 years and some odd months were grouped under 3 years, and children of 30 inches and a fraction tall were grouped under 30 inches. In averaging the weights the nearest ounce was taken. At the bottom of the table is shown the average weight of all the children of a given height. On examination of the figures, however, it was found that the writer had included a certain number of children who were obviously short for their age, and others who were too light for their height. Chart I shows the distribution of the two-year-old boys divided according to their height into 3 groups—

1. Those who are short for their age.
2. Those who are about the average height.
3. Those who are tall for their age.

Of 309 boys, 1 was 28 inches tall, 2 were 29, 1 was 30, 18 were 31, 40 were 32, 58 were 33, 71 were 34, 73 were 35, 32 were 36, 10 were 37, 2 were 38, and 1 was 39 inches tall. In the Chart I, the blocks represent the percentage number of the whole group instead of the actual numbers. 1.3 per cent. of the children fell in Group I, 97.7 per cent. in Group II, and 1 per cent. in Group III. The largest sub-division, or standard for the age, 21.5 per cent. of the total, falls at 35 inches, but the blocks to the right drop off sharply while to the left the drop is much more gradual. In other words, among the 2-year-old boys there is a greater tendency to be short for their age, than there is to be tall. This relationship is typical of the whole series.

Comparing the weight of boys of the same height, but of different ages, it was found that the weights of boys of about the average height for their age fell close to the average weight for their height, regardless of age. There were slight variations but they were not constant. For example, the average weight of all boys 43 inches tall was 41 pounds 3 ounces. Of these, the 5-year-old boys average 41 pounds 8 ounces, while the 6-year-old boys weighed 40 pounds 12 ounces, or 12 ounces less than the younger group. On the other hand, the average weight of boys 44 inches tall was 43 pounds, the 5-year-old boys weighing 42 pounds 11 ounces, and the 6-year-olders, 43 pounds 3 ounces, or 7 ounces more than the younger set. This is contrary to the findings published by the Child Health Organization[22] which allows a gain of one pound per year for boys of the same height but of different ages. In a general way, it was found that the boys who were very short for their age were apt to be light for their height, while the tall boys, under the age of puberty, were up to

Boys

WEIGHT lbs.-oz

HEIGHT INCHES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
0-6 MTHS		9-13	11-11	12-13	14-1	15-10	17-6	18-10	18-11																						
6 MTHS-1 yr					13-15	15-15	17	18-7	19-13	22-12	23-7																				
1 yr.-2 yr								18-6	19-8	20-12	22-9	23-4	25-10	27-1	27-4	29															
2 yr.-3 yr												23-6	25-2	26-15	27-13	29-9	30-4	32	35-14	38-9											
3 yr.-4 yr.															27-15	29-8	30-14	32-8	33-8	35-7	37-9										
4 yr.-5 yr.																28-10	30-3	32	33-3	34-14	36-10	37-15	40-11	42-5	44-1						
5 yr.-6 yr.																		31-8	32-14	35-4	36-14	37-8	39-5	41-11	42-11	45-8	48-13	47-8			
6 yr.-7 yr.																					36-10	38-1	39-8	41-4	43-6	45	46-13	48-4	54-10		
7 yr.-8 yr.																							40-14	41-6	43-4	45-9	47-3	49-1	57-8	55-12	58-5
AVERAGES		9-13	11-11	12-13	14-1	15-12	17-1	18-7	19-11	21-6	22-11	23-12	25-6	27	27-13	29-7	30-11	32-6	33-5	35-2	36-13	37-12	39-9	41-7	43-3	45-2	47-2	48-8	52-5	55-12	58-5

GIRLS

WEIGHT LBS-OZ

HEIGHT INCHES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
0-6 MTHS	8-5	10-6	11-8	12-12	13-14	15-3	15-14																								
6 MTHS-1 yr					14-15	15-10	16-12	18-3	19-11	22-11																					
1 yr-2 yr								17-9	19-2	20-5	22-2	22-8	24-6	26-1	27-11																
2 yr-3 yr											20-13	23-10	24-11	26-12	26-12	29	30-1	30-8	34-11												
3 yr-4 yr														26-11	26-15	29	30-1	31-2	33-4	34-13	34-13	36-4									
4 yr-5 yr																27-14	30-7	30-10	32-14	34-6	36-9	37-6	41-13	42-11	44-4						
5 yr-6 yr																			32-6	34-3	35-4	37-11	38-5	41	42-14	44-13	47-3	46-13	59-5		
6 yr-7 yr.																				34-10	36	37-2	37-15	41	42-10	44-13	46-14	48-3	53	57-4	
7 yr-8 y																						36-7	38-5	40-4	42-10	45-13	46-14	48-4	53-7		
AVERAGES	8-5	10-6	11-8	12-12	14-2	15-8	15-10	18	19-5	20-7	21-15	22-15	24-9	26-9	26-13	28-14	30-2	30-15	33	34-6	36	37-7	38-12	41	42-11	45-2	46-15	48-3	53-13	57-4	

TABLE I GARY GROUP

Boys

WEIGHT LBS - OZ

HEIGHT INCHES	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
7yr.-8yr.	51																								
8yr.-9yr.		53-7	58-10	56-12																					
9yr.-10yr.			60-15	60-4	63-5	64	71-4																		
10yr.-11yr.			56-6	62	66-13		70-9	75-9		80-12															
11yr.-12yr.						70-11	69-2	79	77-6	81-6	81	89-12		93-6											
12yr.-13yr.							83-11	78-11		83-2	86-9	86-10	93-12	105-1	104-2	101		116-5							
13yr.-14yr.										79-8	87-13	91-3	92-3	100	111-2	112-11	115-5	130-12	131-2						
14yr.-15yr.										83-6		90-15	92-1	103-12	110-8	110	117-8	118-6	137-4	132-1	133-7	134-12			
15yr.-16yr.													104-12	102-10	111-2	114-2	125-11	124-13	130-5	131-10	134-13	137-14	148-10	148-5	143-4
16yr.-17yr.																117-5	120-3	125-5	127-11	133-8	134-3	144-15	155	159-3	151-3
17yr.-18yr.																115-4	129-8	124-7	134-2	149-13	140-13	146-12	151	143-11	150-2
18yr.-19yr.																		132-7		139-5	136-10	155-10	152-12		
19yr.-20yr.																					129-2	139-3	159-6		
AVERAGES	51	53-7	58-14	60-9	65	68-7	71-3	77-6	77-6	81-6	87-1	90-1	94	101-14	109-13	110-14	120-2	124-8	131-15	136	136-1	144-2	152-11	149-4	149

TABLE II BENEDICT-TALBOT GROUP.

GIRLS

WEIGHS LBS - OZ

HEIGHT INCHES	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67
9yr.-10yr.	52-9																				
10yr.-11yr.						67-14	68-8	70-13	77-0												
11yr.-12yr.							69-5	72-14	75-14	87-2	90-6	94-7	93-1	112-3							
12yr.-13yr.							68-1	70-14			87-6	93-4	90-8								
13yr.-14yr.									88-1			86-9		111-9	114-15	112-9					
14yr.-15yr.												99-9	109-6	109-1		111-8	113-14	122-5	128-4	123-11	
15yr.-16yr.														112-9		112	119-9	123-4			
16yr.-17yr.															126-4	138-10	118-11	128-13	127-9	134-4	142-3
17yr.-18yr.																124-3	121-2	129-13	117-11		
18yr.-19yr.														105-12	120-5		113	124-8		127-3	
AVERAGES	52-9					67-14	68-9	71-10	77-5	87-2	90	92-3	95-9	110-7	115-6	116-13	118-3	125-6	126-7	126-11	142-3

TABLE II BENEDICT-TALBOT GROUP.

the average weight for height or above it. Just following puberty there was a tendency towards rapid growth in height without the corresponding increase in weight, as shown by the fact that the tallest boys were usually under-weight for their height. In making up our final tables the shortest boys and the tall boys, who were more than 10 per cent. under-weight, were excluded.

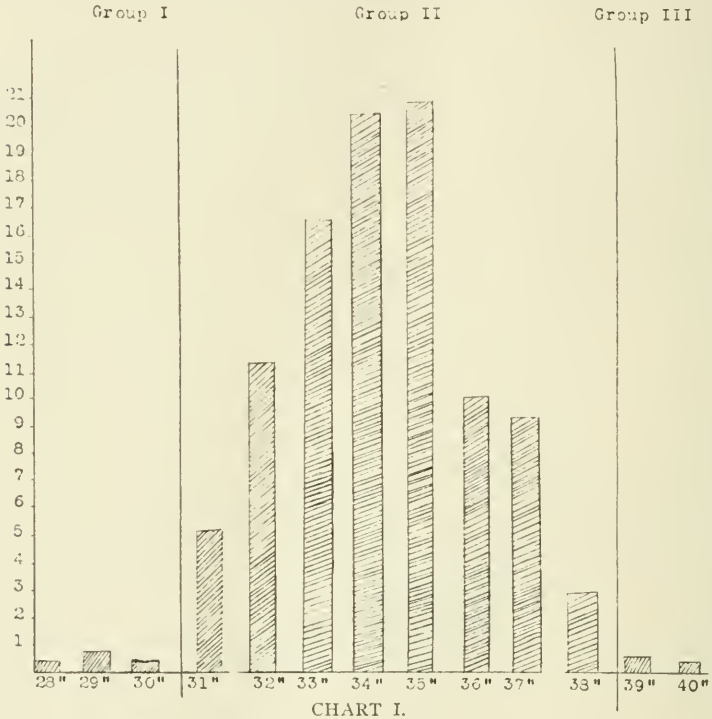


CHART I.

After excluding the short boys, a new set of weights for heights was drawn up and the children re-grouped according to weight into three groups:

1. The malnourished, or 10 per cent. below the average weight for height.
2. The normally nourished.
3. The over-nourished, or 25 per cent over the average.

Comparing the boys and girls it was found that there were more girls than boys in both the extreme groups and that in most cases the lightest girls were lighter than the lightest boys, while

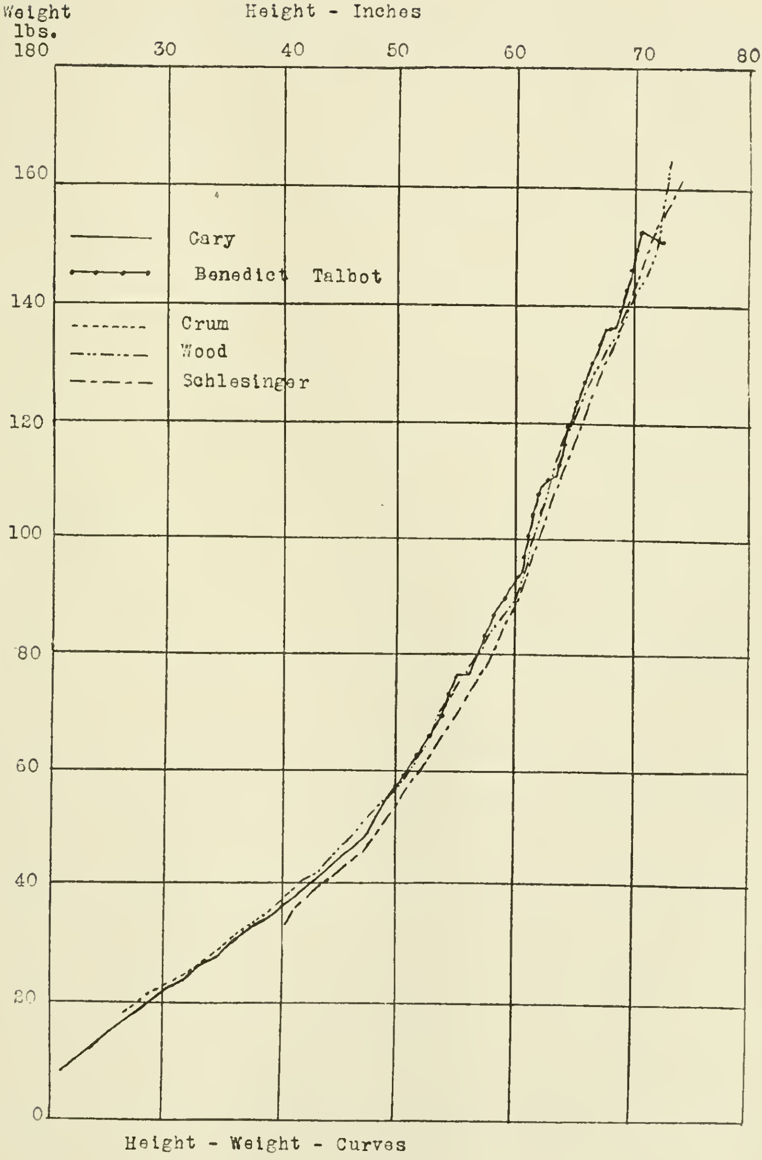

Weight lbs.
Height - Inches
30
40
50
60
70
80
180
160
140
120
100
80
60
40
20
0
Cary
Benedict Talbot
Crum
Wood
Schlesinger
Height - Weight - Curves

CHART. II.

the heaviest girls were heavier. Both the malnourished and overnourished children were considered abnormal and were therefore excluded, and the final tables drawn up.

Chart II shows a comparison of our height-weight curve with that of other observers. Faber[23] has recently pointed out that the average baby of today in San Francisco is larger than the average baby of several years ago and he states that there was reason to believe that similar changes would be found among children in other parts of the country. Wood's figures were taken from private school boys 10 years ago and are therefore directly comparable to the Benedict and Talbot private school boys. Comparing the 2 tables it was found that the latter group, as amended by the writer, was decidedly taller and heavier for the age than the former and about the same weight for the height. This would indicate a racial increase in size for boys under favorable conditions. Crum considered that his children were exceptionally well developed and nourished and that his figures were higher than would be found in other parts of the country. The Gary group corresponds very closely to his, both as to height and weight for age and weight for height. It is interesting to note that the writer's height-weight curve is consistently higher than one presented by Schlesinger[24] for private school boys in Germany.

SUMMARY.

The writer has presented figures for the heights and weights without clothes, (A), of a group of children of pre-school age and (B), of a private school group. All the children were passed as normal by competent observers. Furthermore, he has arbitrarily excluded those who were extremely short for their age, those who were 10 per cent. under the average weight for their height and those who were 25 per cent. overweight. In this way he has arrived at figures which he considers approach the ideal.

REFERENCES:

1. Burk: Am. Jour. Psychol., 1898, 9.
2. Benedict and Talbot: Carnegie Ins. Wash. pub. 302, 1921.
3. Burk, loc. cit.
4. Vallermé: Ann. d'Hyg. Pub. et de Méd. legale, Paris, 1829, I, p. 351.
5. Robertson: Am. Jour. Psychol., 1916, xli, 547.
6. Camerer: Der Stoffwechsel eines Kindes in ersten Lebensjahre, Zts. f. Biologie, 1878.
7. Mallinghansen: Uber Periodic im Gewicht d. Kind., Kopenhagen, 1883.
8. Griffith: N. Y. Med. Jour., 1917.
9. Bowditch: Eighth Annual Report, Mass. State Board of Health, 1877, 275.
10. Schmidt-Monard: Jahrb. f. Kinderh., 1901, 53, p. 50.
11. Bleyer: ARCHIVES PEDIATRICS, 1917, 34, p. 366.

12. Osborne and Mendel: Jour. Biol. Chem., 1915, 23, p. 439.
13. Jackson and Stewart: Am. Jour. Dis. Child, 1919, 17, p. 329.
14. Waters: Proc. Soc. Promotion Agr. Sci. 1908, 29, p. 3.
15. Holt: Diseases of Infancy and Childhood, 7th ed., 1916, p. 18.
16. Retan: ARCHIVES OF PEDIATRICS, 1920, 34, p. 32.
17. Gray and Gray: Boston Med. and Surg. Jour., 1917, 177, p. 895.
18. Crum, Quarterly Pub. Am. Statistical Assn., Sept., 1916, N. S. No. 115, Vol. XV, Boston, pp. 332-336; Chicago, 1910, p. 34.
19. Wood: 9th year book of the Nat. Soc. for the Study of Education, Part I.
20. Holt: Am. Jour. Dis. Child., 1918, 16, p. 359.
21. Holt: ARCHIVES OF PEDIATRICS, 1918, 35, p. 339.
22. Child Health Organization, 1918. 289 4th Ave., N. Y.
23. Faber: ARCHIVES OF PEDIATRICS, 1920, 37, p. 244.
24. Schlesinger: Zeitschrift für Kinderheilkunde, Orig., 1917, Vol. 16, 265.

106 Marlboro Street.

DURATION OF STAY OF FOOD IN INFANT STOMACH (Monatsschrift für Kinderheilkunde, Berlin, June, 1921). Krüger reports the results of fluoroscopic examinations to determine the duration of stay of food in the stomach of over 100 healthy and sick infants. The children were given as test meals from 100 to 150 gm. of the food to which they were accustomed. For 11 breast fed infants the duration of stay, with the exception of one case of pyloric stenosis, ranged between 2¼ to 3½ hours. These were mostly weak and sickly children, but for 3 sturdy infants among them from 3 to 3½ hours were required for the stomach to become empty. That increasing the fat content exerts a retarding effect was shown in the case of a child, with pyloric stenosis, given 80 c.c. of human milk; with a fat content of 0.6 per cent. the sojourn was 6½ hours, but, with a fat content of 4.2 per cent. 8 hours were required. Three children, 2 of whom were strong and hearty and showed no disturbances, required 4 hours to pass undiluted cow's milk into the intestine—much longer than was required for human milk. In 7 sickly infants more or less subject to vomiting, the duration of stay of natural and artificial food in the stomach was normal, except in one instance in which 100 gm. of whole milk gruel required 6 hours to pass out of the stomach. On the whole, however, the children with a delay of over 6 to 7½ hours before the stomach voided its contents were all backward in development and subject to infections and digestive disturbances, with weak and flabby muscles. The delay in evacuation of the stomach was not noted until the children were a few months old, suggesting that the lack of thriving and the impaired motor functioning had some common cause.—*Journal A. M. A.*

LIMITATIONS OF THE RE-INCISION OF THE TYMPANIC MEMBRANE.*

By Samuel J. Kopetzky, M.D., F.A.C.S.
and
Alfred A. Schwartz, M.D.

New York.

The value of incision of the membrana tympani as the surgical procedure in cases of acute otitis media purulenta admits of no discussion. Employed early and properly performed, it is a decided factor in the prevention of subsequent surgical interference on the mastoid process; for we accept the principles laid down by Schiebe, Boenninghaus and others, that the factor which most commonly continues the progress of the ostitis in the usual type of cases—the coalescent type of acute mastoiditis—is the pus under pressure in the middle ear and mastoid cells which is *stagnant*. These observers have shown that as soon as an opening is made into the contiguity of the mastoid process, either by nature, during the course of the disease, as, for example, in the formation of a subperiosteal abscess which is open externally, or by the surgeon, there *immediately* follows an arrest of the progress of the ostitis, and no further bone destruction results.

Due to factors other than the establishment of drainage, however, a certain percentage of cases develop into the type of mastoiditis calling for operative interference in spite of early drum incision. In an effort to prevent this development, a great many physicians—and in this class must be included a number of otologists—incise the drum membrane repeatedly. They argue that if it be true that simple incision of the membrana tympani gives complete relief in certain cases of acute otitis media, then surely in cases where the disease shows a tendency to spread further than the confines of the middle ear and antrum a second incision may increase the drainage obtained; and so they continue on until perhaps shredding of the drum is accomplished in the vain and illogical effort to drain diseased regions which are out of reach of surgery applied to the middle ear.

That paracentesis or repeated paracentesis cannot prevent or cure operative mastoiditis is our contention. Only in young infants can re-incision of the drum-head be logically employed. In these cases, the anatomy presented is such that one finds the antrum located above the level of the tympanic cavity. The bony external auditory canal wall is absent. The roof of the canal is formed by a shelf of bone designated as the "superficies meatus," behind which the mastoid antrum is situated; and in the temporal bones of most infants, this is the only cell which is present. The mastoid process is still rudimentary and undeveloped.

---

*Read before the Section on Pediatrics, New York Academy of Medicine, October 13, 1921.

From the Oto-Laryngological Department of Beth Israel Hospital, New York City.

Bearing in mind this one exception, our contention finds further support in a study of the pathology of mastoiditis, the mode of infection and the clinical course of acute purulent otitis media.

Did we but visualize the stages and evolution of the pathologic lesion in every case as it is presented to us, the chances of misjudging the necessity of repeating the incision of the drum-head would be lessened. Too often the clinician does not do this. All infections of the middle ear seem identical to him; and since he does not pause to consider the pathological processes, incision and re-incision are the only hope he has of avoiding further surgery.

Of what avail is it to repeatedly incise a drum-head to evacuate pus and to attempt to prevent an operation on the mastoid process in the type of case whose clinical history, bacterial flora and general aspect are such that we are reasonably certain that it falls within the group-type termed "hemorrhagic mastoiditis." In this type, the bony frame work of the mastoid is not broken down; and macroscopically it is not affected. The blood vessels are greatly dilated, the mucosa red and swollen, and a little serum and thin pus may be found scattered through the mastoid cells. The infection is not walled off, as in the coalescent type, but the dilated blood vessels rapidly carry the infecting organisms throughout the mastoid and, unless the process is promptly and completely checked, even further, into the sinus, meninges and brain. This form has been rightly called the dangerous form of mastoiditis; and its prompt recognition is imperative for the preservation of the patient's life.

Yet, strange as it may seem, it is this form which is most frequently overlooked by the attending physician. The patient complains of pain in the ear, and there is a high temperature, 103° or 104°. Paracentesis is promptly and properly performed, a free incision being made in the membrana tympani. Much to the surprise of the attendants on the case, there is only a slight seropurulent discharge from the middle ear, the temperature has again gone upward, and the patient is distinctly ill. There may be slight mastoid tenderness, but not sufficient to occasion alarm. Consequently, because the discharge has been so slight and the systemic symptoms so marked, another paracentesis is performed. Then, perhaps a day later, another. And in the meantime the mastoid infection has continued unchecked, and complications with symptoms referable to the sinus and meninges put in an appearance. This picture is not overdrawn, for it has been observed time and time again during the past 2 years, especially during the recent influenza epidemics. In these cases, valuable time has been lost, repeated paracentesis has not prevented the operative mastoiditis and the patient's life has been greatly endangered. A slight discharge from an incision in the membrana tympani may mean, not an insufficient opening, but a virulent infection. In this type of mastoiditis there should be borne in mind another factor—the simultaneous involvement of both middle ear and mastoid where both demand surgical interference almost from the onset.

Again, in the so-called coalescent type of case, where drainage is profuse and inspection reveals that the incision of the drumhead is adequate, and the pus comes away in pulsations, too profuse in quantity to be considered as coming from the tympanic cavity, what is accomplished by re-incising the drum in these cases? Here the postulate of Schiebe and Boenninghaus has been met, and other problems than drainage are demanding solution.

The fact that we desire to stress here is that we must familiarize ourselves to a greater extent with the types of acute purulent otitis media and of mastoiditis. Let knowledge of these become more general, and agreement upon the surgical procedures to be employed will soon ensue.

Of paramount importance to the otologist and patient are the effects of repeated paracentesis on the course of the disease and the final result. When, after the delay occasioned by the attempts to cure the mastoid disease by re-incisions, the patient finally comes to operation, the disease may be far advanced, with marked destruction of the mastoid structure. Due to the frequent incisions, the drum is shredded or may be practically destroyed; and although the mastoid wound closes properly and promptly after operation, a persistent otorrhea may continue for months or years from the middle ear. Then we are confronted with the problems which a chronic purulent otitis media presents, where such a contingency could and should have been avoided.

The hearing is markedly impaired in many cases treated by re-incision, for either the opening in the drum cannot be closed, or a scar is formed which is so large and so adherent to the promontory as to render the drum useless as an aid to hearing. The damage done by the knife thrusts to the delicate middle ear structures is often irreparable; and the symptoms of the so-called "progressive deafness" supervene to make life miserable for the patient—and all this where simple mastoidectomy, performed in its proper time, would have prevented the complications. These are the conditions which the pediatrist and the general practitioner do not see, for later in life it is to the otologist that they come for relief.

It has been claimed that the drum membrane is not essential to hearing and that patients with the entire drum gone may hear perfectly well. This is more apparent than real, and functional tests prove the fallacy of the contention.

In a cursory examination of our office records of recent cases, it has been found that as many as 8 have been under observation that eventually came to operation after having been previously subjected to 3, 4 or 5 paracenteses each before coming under our care; and in some of these all of the paracenteses were made within the first 72 hours. In one, 5 paracenteses were performed in a period of 3 weeks. Not only was not mastoiditis prevented in these cases, but in 3, septic sinus thrombosis developed, and one died of a suppurative meningitis.

The records of our cases of chronic suppurative otitis media, also, are of interest. A large number of these trace their origin to an acute attack where repeated paracenteses were performed. The drum is destroyed, and the usual grave problems of the chronic disease present themselves. Many are now in such a condition that they cannot be cleared without the radical operation.

There are others where the drum membrane has healed and the middle ear is dry. The multiple scars are frequently adherent to the middle ear structures and there is loss of mobility of the ossicles, resulting in marked impairment of hearing and tinnitus.

The object of surgery on the ear is the preservation, as far as possible, of the hearing faculty and the prevention of complicating lesions. In the cases above enumerated, how much better it would have been to have drained the antrum from behind, or eradicated the disease in the mastoid process and to have prevented the chronic diseases from gaining a foothold. For a simple mastoidectomy should leave the hearing unimpaired and markedly diminishes the risk of further complications.

51 West 73rd Street.

THE BINDA SHOULDER SIGN OF TUBERCULOUS MENINGITIS.—(Pediatria, Naples, Sept. 1, 1921.) Tronconi's experience has confirmed the value of Binda's sign for the early diagnosis of tuberculous meningitis, as he shows by a number of case histories from extensive application of the test to sick and well. The sign is the sudden movement of the shoulder when the head is passively turned toward the other side. He places his hand on the patient's head and turns it slowly and gradually from side to side to relax the muscles of the neck. When well relaxed, he twists the head suddenly and abruptly to bring the chin as near as possible to the other shoulder. As this is done, the first shoulder makes a sudden upward and forward movement and persists in this position, resisting attempts to reduce it, until the head is released. In the seven cases of tuberculous meningitis described this sign was constantly positive, and always before a positive response was obtainable with the Kernig, Lasègue, Nizzoli, Oppenheim or contralateral signs. It appeared contemporaneously with the Brudzinski sign. It can scarcely be pathognomonic of tuberculous meningitis, but in his experience it was positive only in the seven tuberculous cases, and was negative in two cases of hydrocephalus and one of cerebellar tumor, in some cases of Weichselbaum bacillus or pneumococcus meningitis, and in a case of serous meningitis with recovery after presenting the Kernig, Oppenheim and Babinski phenomena.—*Journal A. M. A.*

WHEN SHALL THE MEMBRANA TYMPANI BE INCISED, AND WHEN IS RE-INCISION INDICATED.*

By Walter Lester Carr, M.D.

New York.

A routine examination of ears and throat should be made in all infectious diseases, and in every condition where there is a question as to the cause of irregular high temperature, with or without local pain in the ear. A child may have pain without a rise of temperature or at the most only a degree above normal, or there may be restlessness and irritability without temperature and pain. Examination must be made with a good reflected light after the external canal has been wiped clean. The necessity for this examination is shown by the fact that every physician is liable to be chagrined by the report that "the ear burst in the night."

If the tympanum is found to be red and bulging the decision to open the drum is made at once, especially if a child has temperature and pain. When there is congestion and bulging, as is seen in scarlet fever, the advisability of a myringotomy may be determined, in part, by the state of the pharyngeal tissue. It may be possible to abort a mild condition by the use of adrenalin solution, 1 part to 4 or 5 of normal saline solution, instilled into the nares so that it comes in contact with the swollen pharyngeal tissue. If the structures of the pharynx and tonsils are reddened and swollen, so that there is blocking of the outlets of the eustachian tubes, an incision of the drum will be advisable. An incision of the drum is not, however, the whole treatment as in addition to irrigations of the external auditory canal local application to the pharynx and tonsils of argyrol or a similar preparation are essential to get the best results of drainage from the cavity of the middle ear.

In the first class of cases mentioned, where there is an acute infection of the middle ear, as in pneumonia, tonsillitis, influenza. and similar sources of bacterial invasion, the pediatrician is almost always willing to incise the drum or have it done by an otologist as he realizes that to allow an infectious process to damage the structure of the middle ear will cause changes in the drum membrane and ossicular joints and may allow the disease to extend to the mastoid process. Although a patient cannot be protected against mastoid disease associated with a general systemic infection, it is possible to give some drainage through the external meatus. In children, who have an ear ache associated with mild catarrh, nasopharyngitis, hay fever, and gastrointestinal disturbances, decision to open the drum should be determined by the symptoms of the individual child, as one who is nervous and high strung and who has pain and slight elevation of temperature may be better for having the ear drum incised even when there is not much bulging nor congestion.

---

*Read before the Section on Pediatrics, New York Academy of Medicine, October 13, 1921.

Many nervous children get relief by local heat, applications of argyrol to the nasopharnyx and instillations of warm boric acid solution into the ear. Medicinal agents, as calomel, are of service and small doses of codein, antipyrin, sodium bromide, and belladonna give comfort. The instillation of warm oil, or laudanum is not helpful and may be detrimental as it has no value not obtained by sterile warm boric acid irrigations. I have found some benefit when novocain and adrenalin solutions have been dropped on a congested tympanum. In my experience, patients who have relief only when chloroform vapor is blown into the ear require incision.

At the New York Eye and Ear Infirmary the smears of organisms found after incision of the drum show (1) streptococcus, (2) pneumococcus, of the different groups, (3) Friedlander's bacillus, (4) staphylococcus and (5) B. catarrhalis. The colon bacillus is detected during the time an ear is discharging and is believed to be a secondary infection. When cultures are made care must be taken in method and media or staphylococci may overgrow other organisms and give rise to a faulty interpretation.

Re-incision may be required if a primary incision has not been free enough for drainage and when infection and swelling of the soft tissue of the eustachian canal block the way to the pharynx. Re-incision is indicated particularly when there is sagging of the wall of the external auditory canal, even if no other symptoms of mastoid disease are present. Re-incision must be made if a tympanum shows the same condition that necessitated primary operation, viz., pain, bulging and temperature.

Re-incision may be indicated in children of poor vitality where drainage from the middle ear is imperfect even after removal of hypertrophied tonsils and adenoids. Children of low vitality need also hygienic and tonic treatment.

Finally, there are the cases where mastoid symptoms are present when the otologist and pediatrician will have to decide whether a re-incision of the tympanum should be done or the mastoid cells exenterated.

STRIDOR IN YOUNG CHILDREN (Pediatria, Naples, Aug. 15, 1921). Cozzolini has encountered 16 cases in which an abnormally large thymus was evidently responsible for the pronounced stridor observed in the infants from 1 to 11 months old. He applied radiotherapy to 8 of the infants, and a complete cure was realized in from one to four sittings, given twice a week with 3 mm. aluminum filter, and total of from 9 to 16 units. He explains that those who say that thymus stridor is not always curable in this way, mistake stridor of other origin for it. Finkelstein has reported a case in which necropsy revealed an unsuspected fistula between the trachea and esophagus. The rapid subsidence of the stridor is the touchstone in case of doubt. In one infant, after disappearance of the thymus stridor, a congenital larynx stridor became evident, which it had masked. In one infant the excessively large spleen subsided to normal outlines at the same time as the thymus. In 2 other children there was pronounced hyperplasia of the thymus but no stridor at any time. Enlarged glands and congested vessels may coöperate in the compression and induce a kind of erection in the thymus, exaggerating the stridor. In 4 of 7 cases examined with the roëntgen rays, an unsuspected tracheobronchial adenopathy was revealed. The radiotherapy reduced the congestion in the glands and relieved the stridor even before the thymus felt much of an effect from it. The participation of the glands explains how the stridor can occur during both inspiration and expiration. The subsidence of the vascular-glandular-thymus congestion after sudden "thymus death" explains the paucity of the necropsy findings in many such cases.—*Journal A. M. A.*

A CRITICAL CONSIDERATION OF THE FOUR HOUR NURSING AND FEEDING INTERVAL.*

By Thomas S. Southworth, M.D.

New York.

The 4 hour nursing interval has now been on trial long enough to draw some definite conclusions concerning its advantages and limitations. Advocated by Czerny, it was widely adopted in the expectation that it would clear away many of the difficulties of the nursling. Within limits it has proved helpful, but like many other dicta from Mittel-Europa it is too sweeping for universal application.

The feeding of infants is still but a poor thing, if only the needs of a majority are provided for. The supreme test will always lie in the skillful management of the individual, and, to accomplish this, discretion and intelligent discernment are as needful as they have ever been. This warning is always in order, for I am speaking of infants the country over—in maternity hospitals, or attended by obstetricians, general practitioners, and nurses—and not of the more favored few who, in highly organized institutions or private practice, have all the collateral advantages of specialized care. This distinction should be borne in mind.

In a former paper attention was drawn to the longer or shorter "period of adaptation" which a very considerable number of new born infants and their mothers have to go through before mutually satisfactory nursing, with attendant gain in weight on the part of the infant, is established. This period is a critical one for the infant, as upon its correct management depends the continuation of breast feeding and not infrequently the ultimate survival of the child.

The 4 hour interval appears to be admirably adapted to the vigorous normal infant at full term, nursing a normal mother with an abundant supply of good breast milk. Here there is usually no period of adaptation. As soon as the flow is established, the infant gorges itself with breast milk, goes contentedly to sleep, and has time for complete digestion and emptying of the stomach before the next nursing period arrives.

However, we may be prone to forget that where child and maternal breast milk were thus normal, this group, as a whole, throve satisfactorily in former days with regular 2 hour intervals, or 3 hour intervals, or indeed, in thousands of unregulated cases, where the infant asserted its own times and requirements. To give the 4 hour interval its present vogue, there must consequently have been certain types of more exceptional cases in which a longer interval proved distinctly superior. Two of these stood out prominently in their appeal to the obstetrician.

---

*Read before the Thirty-third Annual Meeting of the American Pediatric Society, held at Swampscott, Mass., June 2, 3 and 4, 1921.

One of these was where tenderness of the mother's nipples, with its ever present risk of infection and mammary abscess not only made a shorter interval more hazardous, but painful nursing prevented the full material coöperation so necessary to the normal adjustment between mother and infant.

The second, was that not uncommon type—the over-rich, high fat breast milk. Dr. Holt showed a few years ago that this is an early phenomenon in lactation which tends to decrease and right itself in the succeeding weeks or months. This high fat breast milk undoubtedly had been a great stumbling block to those who, less adept in meeting the situation by other means, now found such cases helped by the longer interval. Vomiting and regurgitation were lessened or relieved by allowing more time for digestion and the emptying of the stomach before being called upon to cope with another meal, and the cumulative restlessness and discomfort (termed colic), so prone to appear in the later hours of the afternoon, were avoided.

Mothers also found the longer interval to their liking, as giving them more freedom, and they very naturally favored it and advertised it. Apparently many obstetricians were among the first to adopt it as a routine measure; and where infants so fed came at the end of the lying-in period into the hands of the general practitioner, the same interval was continued and the custom extended.

If we eliminate the entirely normal cases, which as a rule do surprisingly well with almost any length of nursing interval, it would appear that the adoption of the longer nursing interval was chiefly due to its especial applicability to cases which departed from the normal—in short, to cases of maladaptation. Recognizing this fact, it is not only pertinent but vital to inquire whether the long interval found useful in meeting or avoiding certain conditions of maladaptation may not, when adopted too enthusiastically as a routine, work injury to other important types of maladaptation. As the result of my own observation, I have no hesitation in saying that it does.

The premature infant has long been recognized as requiring more frequent feeding than that born at term. Except in the most skillful hands, such infants often cannot be made to take enough breast milk by any of the usual methods to warrant the longer intervals. I have seen the dire results of applying to them an inflexible rule.

Of full term infants there is a very considerable group of maladaptation cases, in which the obstacle to receiving an adequate amount of breast milk may lie with the infant, the mother, or both. There is the sluggish, dormant infant who is with difficulty stimulated to take a sufficient quantity of breast milk in only 5 daily nursings. There is the baby who is too weak, or learns with difficulty to take the nipple vigorously, especially from moderately malformed nipples, and does not empty the breast. There is the nervous, inexperienced mother, who does not know how to coöperate with the baby, and defeats its efforts. These instances suffice to outline types where more frequent nursings are indicated else the baby may suffer, and an adequate breast milk fall off from lack of stimulation.

There is, finally, the large and perhaps increasing number of mothers whose breast milk, while scanty and insufficient, is still capable of being made abundant enough to establish maternal nursing wholly or in part if the stimulation is maintained with adequate frequency.

For the majority of infants in the above types, the 4 hour period is both irrational and injurious. This is especially true of the last group, where breast milk is scanty and can be increased by more frequent nursing. Such infants, nursed only every 4 hours, are further menaced when their failure to gain, under a method which is not adapted to their needs, leads to the giving of substitute feedings.

Complemental feedings, given at the conclusion of a nursing, to make up any deficiency in the breast milk obtained, are always justifiable when occasion demands, and should be employed more frequently; but the substitution, ignorantly made, of one or more bottle feedings to take the place of already too infrequent breast nursings, is the most scientific way of drying up the breast milk and precipitating unnecessary weaning. With a 2 hour or a 3 hour interval, where the nursings are more numerous, substitution may have a place and be pemissible under special circumstances, but where the nursings are as low as 5 a day, complemental or p. c. feeding is the only rational procedure. In many instances complemental feeding, coupled with a return to shorter intervals, produces the best results.

The ease with which breast milk is digested in the infant's digestive tract has doubtless contributed materially to the success of the 4 hour interval. Former estimates of gastric capacity at different months as a guide to the amount an infant should receive were first overthrown by weighing before and after nursing, which demonstrated that many infants took at a single nursing a quantity far in excess of gastric capacity. Ocular proof of the passage of breast milk into the duodenum during nursing was later furnished by the fluoroscope.

We are, I think, not yet ready to believe that cows' milk can be as safely entrusted to intestinal digestion without some degree of gastric action, and consequently the quantity of bottle food allowed infants of varying weights and ages has been more closely limited. Since there are definite differences between breast milk and cows' milk, and all sorts of modifications of the latter are necessary to meet individual needs, it does not necessarily follow that because a 4 hour interval may be applicable to breast feeding it will be equally so to bottle feeding.

Long before this interval became popular, we had recognized its helpfulness in cases of regurgitation and vomiting, in which the fat of cows' milk and its fatty acids played a causative part. Just as with breast milk, the difficulty in the digestion of the fat of cows' milk, shown by the cumulative discomfort of the late afternoon, tended to disappear with the longer interval; but here the analogy between the 2 milks appears to cease. It is a question in my own mind whether with young infants, who must necessarily be brought up on the bottle, the total results are any better by adopting too rigidly the longer interval. Certain very young infants are with difficulty given adequate amounts of diluted cows' milk, and such infants run the risk of being underfed.

After all, the art of the skillful pediatrician is taxed not by the normal infant, but by those whom we class as difficult to feed. The more notable advances in feeding in this country have been made along the lines of adaptation to the requirements of the individual case. The acceptance of any hard and fast rule is a retrograde step, at variance with our best traditions, since the needs of the individual must be carefully weighed with reference to this factor of interval, as well as to all other factors in infant feeding.

807 Madison Avenue.

DIAGNOSIS OF PULMONARY TUBERCULOSIS IN CHILDREN (Tubercle, London, February, 1921). The investigation reported on by Stewart was undertaken in 300 children whose ages varied from 5 to 14 years. Of these 223 were considered to be suffering from pulmonary tuberculosis. It is evident that family and personal history lead but a very little way toward a diagnosis. Laboratory investigation is limited to the very few instances in which sputum is available. Of course, if tubercle bacilli can be demonstrated microscopically or by inoculation, the diagnosis can be regarded as final. Other laboratory methods are not established. Physical examination is very valuable but its results are sometimes indefinite both as regards the existence of active disease and very often indefinite as regards the nature of the disease if signs suggesting morbid change are found. Of specific tests, the subcutaneous is inadvisable. The quantitative cutaneous is of great value. Its shortcomings are that it is negative where the resistance is high and also where toxemia is marked. Radioscopic examination would appear unsatisfactory in that its definitely positive assertions lead to such a margin of inaccuracy. It is obvious that no one method can be relied on in making a final diagnosis of pulmonary tuberculosis in children, except, of course, demonstration of tubercle bacilli. Before the disease is localized and its nature and activity established, all the safe approaches may have to be explored, but two combined methods are pre-eminently reliable, namely, physical examination associated with quantitative cutaneous testing.—*Journal A. M. A.*

A FEW SPECIFIC DIAGNOSTIC POINTS IN THE TREATMENT OF CHILDREN.

By S. G. Glover, M.D.,

Greenville, S. C.

In the private practice of pediatrics I have often thought of the importance of keeping certain cardinal diagnostic points in mind as an aid to diagnosis. It is not my intention in this paper to cover the whole subject but only to call your attention to a few of these specific conditions frequently met with in this work.

The hydrocephalic head is rounded and enlarged symmetrically and the whole forehead overhangs. On the other hand, when the top of the head is flat you think of the so-called square head of rickets. Early closure of the anterior fontanel may be attributed to 2 causes, a small brain, or it may be an individual peculiarity, but if the closure is delayed it is usually due to rickets, but may be the result of hydrocephalus. When the fontanel is bulging you suspect intracranial pressure, and if it be depressed, it leads you to believe there is a decrease in the intracranial pressure. When you see a baby with hair too coarse always think of insufficiency of the thyroid gland.

A discharge from one side of the nose suggests a foreign body in the nose, but when you have a thin, irritating discharge from both sides, especially if it be tinged with blood, one should think of diphtheritic rhinitis, while a mucopurulent or purulent discharge, certainly if bloody, is characteristic of lues. The most frequent cause of nephritis, tonsillitis, and otitis media, is sepsis in the nasopharynx. A child with its mouth continually open generally has some obstruction in the nose, and the most common cause is adenoids. A usual pathognomonic sign of measles is Koplik's spots, most always situated on the buccal mucous membrane. These are rose-red spots, the size of the head of a pin, with a pearly-white spot in the center. It is a frequent occurrence for children to have large tonsils at the time of the second dentition. When Hutchison's teeth are present among the permanent teeth, you are supposed to have in them typical lesions of lues. Always use extreme care in examining a throat when you suspect a retropharyngeal abscess, because if the jaws are suddenly too widely distended, or for any reason the abscess is ruptured before proper precautions have been taken, sudden death may result from the child choking from the pus. Of course, no physical examination is complete unless some satisfactory explanation of the symptoms are found elsewhere, without an examination of the middle ear.

In acute rheumatism you not only consider the teeth and tonsils, but also the ears as being the cause. When you see a white spot in the pupil of a baby's eye, it generally means congenital cataract, and a cherry-red spot (which is an area of congestion of the vessels about the retina) is very suggestive of amaurotic idiocy. This disease occurs in the first 3 years of life and is confined to the Jewish race. A common cause of puffiness under the eyes in children is some obstruction in the nasopharynx, although the main causes are affections of the heart and kidneys.

You may consider any cervical glands that have a duration over 4 to 6 weeks as being tubercular, and they should be removed when they are associated with large tonsils, 95 per cent. having been proven tubercular.

The rosary is an over-growth of tissue at the junction of the ribs with their cartilages, which results in the formation of a series of prominences resembling beads, and it is the most common abnormality of the chest, being caused by rickets. A differential point between congenital atelectasis and congenital heart is that in congenital atelectasis the color of the child gets better when it cries, and in the congenital heart, the color of the child gets worse when it cries. You will obtain in infants interscapular dullness on the left side more so than compared to the right, because of the big vessels of the neck, this dullness being normally there. Never use the terms "prolonged harsh breathing" because that is normal in infants, but prolonged harsh breathing in adults is abnormal breathing. If the heart gives out in pneumonia it is generally myocarditis causing it. In pneumonia you may figure that you are going to have empyema as a complication in the proportion of 1 to 20. The cause of hiccoughs in pneumonia is an irritation of the pneumogastric nerve.

When you see a child with an enlarged abdomen, there are 3 main conditions to think of as being the cause, tubercular peritonitis, sarcoma of the kidney, and general dilatation of the intestines from disturbance of nutrition. Less common causes are cirrhosis of the liver, obstruction of the intestines and intussusception. Hemorrhage from the stomach should suggest tubercular peritonitis as a general thing. An enlarged spleen is very suggestive of something specific, as malaria or lues.

A pistol shot sound in the groin when obtained is characteristic of aortic regurgitation, and it often precedes the aortic regurgitation. A pistol shot and soft systolic murmur combined go with anemia.

Mucous patches about the anus may be found at any age and are invariably characteristic of lues.

Intussusception begins acutely with pain in the abdomen and evidences of shock, the stools of mucus and blood not appearing until later, whereas the onset of infectious diarrhea is less acute, pain is usually not present, or if so, it is slight, and there are no symptoms of shock, while the stools of mucus and blood appear almost at once. The stools contain no fecal matter in intussusception while they usually contain some in diarrhea. The abdomen is almost always sunken in infectious diarrhea, but likely to be somewhat distended in intussusception. There is never a tumor mass in the abdomen or rectum in infectious diarrhea, while there is often one in intussusception.

Sabre tibia or sabre shin is a tibia with a marked anterior convexity and it, like Hutchison's teeth, is indicative of hereditary lues.

Pernicious anemia does not occur in infancy or up to 12 years of age, but there are about 4 cases of pernicious anemia on record at the age of 12. When you think you have pernicious anemia in a child under 12 years of age be absolutely sure your anemia is pernicious and not otherwise. When you have symptoms of paleness, enlarged spleen, and deafness, they are to be associated with leukemia.

You will as a rule find that a Mongolian idiot has either a congenital heart, undescended testicle, web toes, and always small genitals, and they are usually very restless, never responding to thyroid, whereas a cretin is usually very quiet, and responds to thyroid medication.

Lues is not a causative factor in chorea. As a routine, always examine the teeth and tonsils; do not remove the tonsils but you may remove the diseased teeth in acute chorea.

Tuberculosis in early childhood is nearly always general and human, but later in life you find it to be local and bovine.

The acute infections as a complication in scarlet fever do not occur after 3 weeks. By acute infections we mean joint conditions and otitis media. Occasionally a kidney condition develops after 3 weeks. Arthralgia simulates rheumatism, and usually as a complication it occurs after 3 weeks. It is rare to see scarlet fever in a child under 6 months of age.

The complications of measles are pneumonia, otitis media and pyelitis.

An explanation of the white color of a child, edema of the skin, and the rapid loss of weight when taken sick, on obtaining a history of its being fed on proprietary foods, is because to each molecule of fat deposited there is one molecule of water deposited, and to each molecule of sugar deposited there are 3 molecules of water deposited. If you have a case of infant feeding, and the weight is below 50 per cent., it complicates to the extent of making the problem more difficult.

Scurvy usually invades the lower end of the femur. Bloody urine, when you can rule out nephritis, suggests scurvy. You may be called to see a child who you are told has either rheumatism, infantile paralysis, injury, nephritis, epiphysitis or osteomyelitis and after investigation the case turns out to be scurvy, because scurvy often simulates these conditions.

If you have a child that you are treating with fever of unknown origin, and everything else is ruled out, it is generally otitis media or pyelitis.

Urine is clear normally. In true pyelitis you not only have pus cells, but cloudy urine also. Therefore cloudy urine should make one suspicious of pyelitis. Why not believe that pyelitis is ascending because if it is descending, why don't you find casts in the urine as well as pus cells?

On obtaining cloudy spinal fluid from a lumbar puncture, it should mean epidemic cerebrospinal meningitis, and this disease is nearly always fatal when it occurs in a child under 2 years of age.

The classification and differential diagnosis of diarrhea is a chapter in itself, and I will not attempt to go into the subject except to speak of some points that might be of interest, as, for instance, in a gas bacillus diarrhea do not feed starch because the gas bacillus thrives on starch, and in a Shiga bacillus diarrhea do not feed protein because the Shiga bacillus thrives on protein. Free neutral fat in the stool is rare; the usual fat in the stool is in the form of fatty acids. In finding fat in the stools it is well to ask if vaseline has been used in the nose, ointments about the buttocks, or if castor oil has been given, because each one of these things can cause fat in the stool and may be found to be confusing. Casein curds can be differentiated from fat curds in as much as protein curds cannot be mashed easily and fat curds can. A fat indigestion is preceded by loss in weight, whereas sugar indigestion is preceded by loss in weight, irritated buttocks, and grass-green stools. The shine in the stool after the stool is smoothed out on the napkin always means a protein stool. Blood in the stool fades usually in 6 hours, that is, when the stool is spread out on the napkin, but blood mixed with mucus holds and is plain to be seen. A brick-red color on the napkin is due to urates from the urine. A stool will turn slightly green if allowed to remain on the napkin 6 or 8 hours, due to changes in the bile, but watery, grass-green stools indicate too much sugar, especially if the child's buttocks are irritated or scalded.

A CASE OF DECEREBRATE RIGIDITY (The Lancet, London, Nov. 26, 1921). A. P. Thomson and A. Piney describe this case occurring in a girl 4 months old, with a history of three days' illness, during which she vomited all her food and had twitchings of the right side of her face and legs. The clinical aspect of the case after a few days was one of complete decerebrate rigidity of the type expected after ablation of the cerebral cortex. There was very little change in the child's condition during the two months of her illness. The clinical features of the case bore a close resemblance to the condition of decerebrate rigidity described by Kinnier Wilson. There was nothing to lead one to believe that the child suffered from any brain disease at birth. The autopsy revealed diffuse softening of the cerebral cortex and calcification of the cerebral vessels. The anatomical changes present appeared to be the effect of an inflammatory lesion of about two months standing. The writer has been unable to find an identical case in the literature of the last twenty years, and cases with even a slight similarity are rare..—*Medical Record.*

EGG YOLK IN INFANT FEEDING.*

(Preliminary Report.)

By Adolph G. DeSanctis, M.D.

New York.

During the last 2 years, the writer has used egg yolk as an adjunct in difficult feeding cases. Its value was recognized in certain cases which did not do well on various formulas and in which as much food was given as was possible. In the first case in which it was tried, an infant 3 months old had been receiving a formula of whole milk, water, and dextri-maltose; 65 calories were given per pound per day with no gain in weight; the food was then increased gradually until 85 calories per pound per day were given. The infant was taking all the food, was not vomiting, was having normal stools and still did not gain. After giving such a strong formula for a few days, the child began to vomit so that it was necessary to reduce the food to 65 calories per pound. One teaspoonful of the yolk of a soft boiled egg was then added daily to the formula. The response was immediate, the child gained in weight, and the general condition improved. The yolk was then gradually increased until the whole yolk was added daily. From that time on, the infant gained 8 to 12 ounces weekly. That the gain in weight was due to the extra calories added in the form of the egg yolk can be ruled out because the child did not respond when 85 calories per pound per day were given. The writer believes that the gain in weight was due to the addition of the fat soluble B vitamine contained in egg yolk. Since the first experiment, egg yolk has been used in many cases with the same result. It has also been observed that infants receiving the maximum amount of food (65 calories per lb.) and 1 to 2 ounces of orange juice, who were not doing well, would gain immediately when egg yolk was added to the formula. The fact that orange juice was given before the addition of egg yolk would rule out that failure to gain in weight was due to a deficiency of the antiscorbutic vitamine. Undoubtedly the fat soluble B vitamine plays an important part in the nutrition of infants. In giving the egg yolk to infants, the fat soluble B vitamine is added in considerable amounts, and can be given with safety to infants as early as the second month, as it very rarely causes a gastrointestinal upset. In my experience it is very valuable in:

---

* From the Pediatric Department, New York Post Graduate Hospital.

1. Athreptic infants.
2. Infants receiving the maximum amount of food (65 calories per pound per day) and ½ ounce of orange juice and still not gaining.

Case Report.

Baby C. A. Three months old, seen on March 12, 1920.

Family History. Negative. 5 other children, all breast fed; none were difficult feeding cases.

Past History. Normal delivery, at term; birth weight 7½ pounds.

Feeding History. Never on breast; mother had post-partum hemorrhage.

Put on dilution of whole milk, water and milk-sugar right from birth. When first seen was receiving:

Whole milk	14 ounces
Water	12 ounces
Milk-sugar	2 rounded tablespoonsfuls.

Weighed 8 pounds.

Was having 2 yellow, firm stools daily, with no mucus and no curds. Was leaving ½-1 ounce in each bottle. Was vomiting about ½ ounce after each feeding. Very restless.

Physical Examination. Negative except for the extreme emaciation.

Treatment. On account of the vomiting and poor appetite a formula of:

Whole milk	10 ounces (boiled 3 minutes)
Water	20 ounces
Dextri-maltose	1 level tablespoonful

was given; 7 feedings 4 ounces q.3.h.

When seen after 2 days, the vomiting had stopped, and the infant was taking all the food. The formula was gradually increased to:

Milk	20 ounces
Water	15 ounces
Dextri-maltose	4 level tablespoonfuls

7 feedings, 5 ounces q.3.h. Besides it was getting 2 ounces of

orange juice daily. The infant was taking all the food, was not vomiting but was not gaining in weight. From March 12, when first seen, to April 1 it had only gained 1 ounce. At that time 1 teaspoonful of yolk of a soft boiled egg was added to the same formula. After the addition of the yolk, the infant gained 9 ounces the following week. The whole yolk was then added, but the formula was otherwise not changed. When seen again on April 15, 2 weeks after starting the yolk, the child weighed 10 pounds 2 ounces, having made a gain of 2 pounds 2 ounces in 15 days. From that time the infant continued to gain.

4 East 9th Street.

RHEUMATISMAL AORTIC ENDOCARDITIS IN CHILDREN (Presse Médical, Paris, Sept. 7, 1921). Nobécourt and de Toni analyze 33 cases of endocarditis in children from their service during the last eight months. Acute articular rheumatism was responsible for 21 of the 33; scarlet fever or chorea in 4 each, and associated diseases in 4. In 39 per cent. of the 33 there was disease of the aortic valve, but in none of the scarlet fever or chorea cases. Both aortic and mitral disease were found in over half of the rheumatismal cases. With the aortic disturbances predominating and the mitral slight, the prognosis is comparatively benign; long tolerance may be anticipated under good hygiene. But with the mitral predominating, the future is graver as asystolia is a frequent eventuality. The deadening of the second sound at the base, characteristic of aortic endocarditis, is usually quite pronounced in children. In 4 of the 7 children, with aortic endocarditis from recent rheumatism, there were no symptoms to call attention to the heart; only the physical signs revealed it. As the blood vessels in children are normal in comparison to those of adults, the symptoms of aortic insufficiency differ from those in adults, but there is usually bulging of the precordial area, and the heart beat is violent here, and the apex low and farther toward the axilla than common. Hypertrophy of the left ventricle was pronounced in the majority, and the whole heart was enlarged. The characteristic systolic murmur was sometimes accompanied by a diastolic murmur.—*Journal A. M. A.*

CLINICAL DEPARTMENT

CASES CONTRIBUTED BY

H. R. LITCHFIELD, M.D., and F. R. MASON, M.D., New York
MARK S. REUBEN, M.D., and H. O. ZAMKIN, M.D., New York
MANNING C. FIELD, M.D., Brooklyn, N. Y.

CASE NO. 22.* Male, 5 years old.

Still's disease has been referred to by Dr. L. F. Barker[1] as "a chronic arthritis of childhood representing neither a clinical nor an etiological unity" and while we do not disagree with this view we feel that there are sufficient associated findings with this form of chronic arthritis to separate it somewhat from the other forms. For this reason we are reporting this case.

Still's disease has been described as "a form of chronic or recurrent arthritis, in which, despite the absence of demonstrable bacterial causation, the assumption of a continual or recurrent bacteriemia of low grade with joint deposition seems plausible." This condition has been found more frequently in boys than girls, and in most cases has followed either scarlet fever or measles. The chief symptom has been a multiple joint involvement, the earliest affected usually being the interphalangeal joint. Pathologically this condition is really more a periarthritis than an osteoarthritis. There may be involvement of the synovial membrane, joint, capsule, and surrounding tissues; occasionally, the joint may contain fluid and still more rarely, if the condition lasts for a long period of time, the cartilage may become eroded. The other symptoms, and some of these are more or less distinct in this type of joint affection, are: Fever, sometimes very high, irregular and somewhat septic in character; a generalized glandular enlargement, associated with an enlarged liver and spleen; a leukocytosis and a secondary anemia. In many cases a systolic murmur has been heard at the apex of the heart and the urine on examination has shown albumin and a variety of casts.

It is not surprising, on going over the literature considering the question of this condition being a clinical entity, to find how few references there are.

---

*Still's disease (atrophic arthritis). Preliminary report of a case.

Still first reported this condition before the Royal Society of Medicine in 1896, at that time reporting 22 cases.[2] A few cases were reported by Demme, Hingston and Newton; J. Piske reported 2 cases[3], Willners[4] and A. S. Rosenfeld[5] each reported one case. It is mentioned by Holt under chronic arthritis and Osler-McCrae[6] classify it as a distinct form of arthritis deformans in children. It is also referred to by Barker in Monographic Medicine, as previously stated.

Unquestionably the disease is due to an infection somewhere in the body and the fact that it nearly always follows scarlet fever or measles, both diseases which are characterized by a severe infection of some part of the respiratory tract, makes us suspicious that the mode of entry of this organism is, as so often the case in acute articular rheumatism, the upper respiratory tract. The question of its being a specific organism has not as yet been determined, just as in rheumatism no organism has been isolated from the blood stream.

CASE REPORT. P. K., age 5, was admitted to the Willard Parker Hospital on January 2, 1921, after an illness of 4 days at home. On admission he had all the prodromal symptoms of measles,—coryza, conjunctivitis, cough. Koplik's spots were questionable at the time of admission and no rash, but on the second day in the hospital the macular-papular rash appeared and Koplik's spots were present. The case was diagnosed measles.

Family History. Boy born of healthy parents. No veneral diseases in the family. No miscarriages.

Development. Full term, normal labor; the baby was breast fed till the 9th month. Child then progressed normally till the age of three.

Past History. Negative. At the age of 3, child was ill for 2½ weeks with what the mother thought was intestinal spasm with high fever, not associated with vomiting, headache or pain anywhere else in the body.

Present History. Mother claims that for the past 2 months the boy has been losing color and strength, that his appetite has been poor and that there has been a marked decrease in his playfulness.

PHYSICAL EXAMINATION ON ADMISSION. January 2, 1921.

General Appearance. Dull and apathetic, not acutely ill. Skin was warm, moist and no rash.

Throat. Slight congestion of the tonsillar pillars.

Eyes. Simple conjunctivitis, pupils react to light and accommodation.

Nose. Coryza.

Ears. Negative.

Heart. Soft systolic murmur at the apex.

Lungs. Slight dullness over right base. Scattered sibilant râles heard posteriorly. Breath sounds normal.

Abdomen. Liver palpable one finger below the margin of the ribs.

Extremities. Negative.

Bedside Notes.

January 4. Macular-papular rash present over body and extremities.

January 5. Examination of lungs showed a disseminated bronchopneumonia.

January 14. Temperature rose to 103°, examination showed bilateral bulging ear drums; incision and drainage of pus.

January 16. Temperature normal. Discharging ears. Report of urine examination—albumin positive, occasional casts.

January 18. Bilateral cervical adenitis. Lungs clear.

January 28. Temperature again rose to 104.6°. Throat was negative, ears still discharging. Rest of physical examination was negative except inflammation, swelling and tenderness over the phalangeal joints, especially middle finger of left hand; right elbow was swollen with slight inflammation and tenderness.

January 31. Polyarthritis present, left knee and ankle involved, fusiform appearance of left middle phalanx. Report of urine examination showed albumin positive with a variety of granular and hyalin casts.

February 4. Blood culture reports negative. Wassermann report negative.

February 14. Examination of joints by orthopedic surgeon, Dr. J. J. Nutt, ruled out tubercular joints and rheumatic arthritis, since the medication of salicylates was ineffective. Advised mobilization in plaster casts. Advised x-ray. Diagnoses not established.

February 16. Persistence of double aural discharge, polyarthritis and general adenopathy; liver and spleen both palpable.

February 21. Roentgenograph reports absence of changes in bones and cartilages of joints. No ankylosis. Epiphyseal ends of bones seemed unduly large in comparison with the undeveloped shafts.

Reports of the blood culture were again negative. No aural discharge.

PHYSICAL EXAMINATION. February 23, 1921.

General Appearance. Emaciated, poorly developed, poor musculature. Shows loss of flesh and strength.

Head. Contour normal, no craniotabes, head in the median line, fontanels are closed, no McEwen. Hair, dry, fine, brown. Face, normal appearance, low grade infection. Eyes, no strabismus or nystagmus, ocular movements normal. Pupils react to light and accommodation. Nose, negative. Ears, no discharge. Mouth, opened voluntarily, lips not cracked, gums negative, tongue coated brown. Teeth, 2 carious right and left molar normal in shape, no erosion of enamel. Mucous membranes, negative. Tonsils, negative.

Neck. Visible pulsation over right jugular vein. No venous hum. A few palpable anterior cervical glands, posteriorly they were numerous, shotty and rolled under the fingers. Thyroid gland not enlarged.

Chest. Lungs, resonant throughout, breath and voice sounds normal. No positive d'Espine sign.

Heart. Inspection, apical impulse visible. Percussion, left border extends ½ inch beyond mammary line; right border to right edge of manubrium. Auscultation, heart sounds are rapid and weak, a faint systolic murmur is heard at the apex. Base, A2=P2. Cardic hepatic angle is normal. Peripheral circulation is poor.

Abdomen. Scaphoid, skin is discolored and mottled, no dehydration. Liver can be palpated about 2 fingers breadth below margins of ribs. Spleen moderately enlarged. No areas of tenderness, no masses. No tympanites.

Extremities. Upper swelling of middle phalangeal joint left hand, tender to pressure and fusiform in appearance.. Movement of joints limited. Finger tips not clubbed. Epiphysis normal. Shafts of bone not tender or swollen. Lower, left leg held flexed at right angles on the thigh. No limitation of motion at hip joints. Left knee swollen, tender to pressure, no redness. Left ankle joint swollen, tender to pressure, no redness. Right leg apparently normal at this time.

Reflexes. No rigidity of neck, no Brudzinski, no Kernig, no Babinski, Gordon, or Oppenheim. Positive ankle clonus on right side. Knee jerks normal. Abdominal reflexes present. Cremasteric reflex present. No tâche.

Glandular. General adenopathy, especially the peripheral lymphnodes, small shotlike glands in the axilla, groin and posterior cervicals. No rheumatic nodules.

Skin. General anemia, dry, waxy discoloration of the skin. Some areas show a mottling.

Sensation. No disturbance.

Diagnosis. Established on the following points:—

(1) Adenopathy (peripheral lymphnode enlargement).

(2) Enlargement of the liver and spleen.

(3) Anemia, loss of strength and appetite.

(4) Polyarthritis.

(5) Absence of any changes in the cartilages of the affected joints or in the bones as shown by x-ray. The swelling was periarticular.

(6) Blood cultures were negative.

Blood Count. Total red blood cells, 3,500,000. Hemoglobin, 70 per cent. Total white blood cells, 18,000. Polymorphonuclear cells, 79. Large mononuclear cells, 5. Lymphocytes, 16. The blood count never varied very much.

Prognosis. There does not seem to be any immediate danger to life. The patient has been ill for the past 2 months, but in the week of this report he has been apparently quite well, his appetite has improved and he looks much brighter than at any time during the past 2 months. We attribute the systolic murmur to be due to myocardial disturbance; the enlargement of the liver, most probably to fatty changes. He may continue, however, to get joint pains from time to time and get some deformity perhaps due to adhesions and thickening about the joints.

Treatment. The treatment is symptomatic. Salicylates as shown were of no value in this disease. Soft diet, including eggnogs, beef, and fruit juices daily. Feeding of yeast, one cake divided into 3 portions daily. Maltine preparation with iron, quinin and strychnin, dram t.i.d. Mobilization of the affected joints in plaster casts.

REFERENCES:

1. Barker, L. F.: Monographic Medicine, Vol. 4.
2. Still, G. F.: Royal Society of Medicine, London, Nov. 10, 1896; Allbutt and Rolleston's System of Medicine, 1st Ed., 1897.
3. Piske, J.: Med. Klin., 1913, 9.2.
4. Willners, O.: Centralb. für Spezgeb. der Med. und Chir., Jena, 1911. Vol. 14.
5. Rosenfeld, A. S.: Jour. A.M.A., July 14, 1917.
6. Osler and McCrae: Modern Medicine.

HARRY R. LITCHFIELD AND F. RAOUL MASON.

CASES NO. 23 and 24.* Female, 12 years old; female, 10 years old.

CASE I. Celia M. was brought to the pediatric department of the Vanderbilt Clinic for progressive loss of fat. A glance at the patient left no doubt that we were dealing with a case of lipodystrophia. The patient was delivered at full term; labor was normal; weight at birth was 3½ pounds; was not breast fed. She began school at 6 years and is at present in 6B grade; somewhat behind for age. She had pertussis at 4 years, measles at 5 years, and scarlet fever at 6 years. (Incision of cervical glands following scarlet at 6 years.)

For the last 3 years mother has noted a progressive loss of fat from the body; this took place first in the face and has progressed as far as the inguinal regions. The buttocks and lower extremities are not affected. The child presents a general appearance of emaciation; the color is dark; mentality is normal for age. Heart and lungs are negative. The pulse is rapid (110); the blood pressure is normal—systolic 95-100, and the diastolic 92. The genitals are somewhat overdeveloped for age; the secondary sexual characteristics are all present (pubic hair, axillary hair and enlargement of breasts). The cervical epitrochlear and inguinal glands are enlarged; the thyroid is palpable.

Measurements: Head, 20¾ inches; chest, 26 inches; height, 58 inches; weight, 73¾ pounds (15 pounds under weight for height and age). Muscular power normal; no increase in fatigue. X-ray of pituitary, normal; x-ray of wrist, normal for age.

CASE II. Laura N., 10 years of age, born at full term, delivery normal, birth weight 12½ pounds, breast fed for 12 months. She held the head up early, sat up at 5 months, first teeth at 14 months, walked at 11 months and talked at one year. She had measles at 18 months and is subject to frequent colds; she is markedly constipated and sleeps very poorly.

---

*Cases of Lipodystrophia Progressiva. From the Pediatric Department of the Vanderbilt Clinic, New York.

One year ago, the mother noticed that the face was becoming gradually thinner, whereas the lower part of the body was becoming more adipose. The child is 47½ inches tall and weighs 74 pounds; abdomen at level of umbilicus 27 inches.

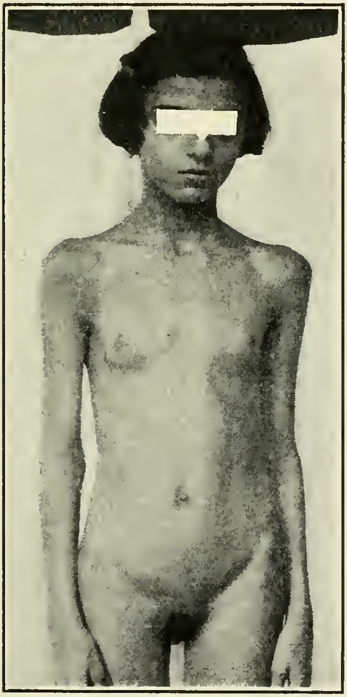


Fig. 1. Celia M. 12 years old.

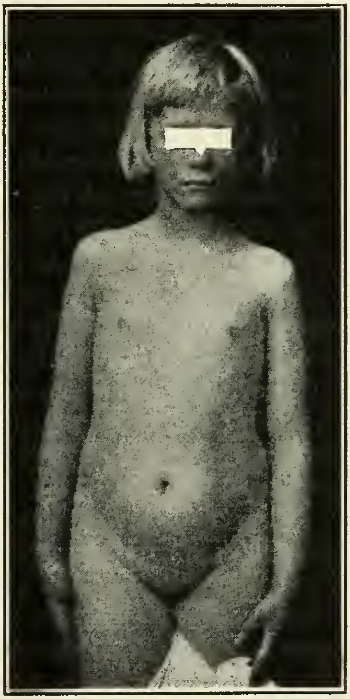


Fig. 2. Laura N. 10 years old.

The mother brought the child to the Vanderbilt Clinic on account of frequent attacks of bronchitis associated with asthmatic seizures. However, the facies is so characteristic, that it leaves no doubt as to the presence of lipodystrophia progressiva, especially when considered in conjunction with the increasing adiposity of the lower part of the body.

GENERAL DESCRIPTION. One is immediately struck by the disproportion between upper and lower parts of the body. The face is haggard and has a cadaverous expression. It is hollowed in the temporal region. The malar bones are prominent and below them are 2 hollows—an upper small one and a lower large one, separated by a thin bridge, corresponding to the zygomatic muscle. There are also distinct grooves under the lower lip and on either side of the chin. When patient smiles folds form on both sides of mouth.

There are no disturbances of function or sensation in the parts affected. All tendon reflexes are normal; electrical reactions are negative. X-ray of skull is negative. The patients are just as active and as strong as normal individuals of same age.

The etiology is obscure; there is a hereditary tendency. There are no symptoms referable to the ductless glands. Treatment with products derived from ductless glands is of no avail. In most cases it seems to follow an infectious disease or an injury.

The chief symptom is progressive loss of subcutaneous fat which begins insidiously without fever, pain or any other symptoms, and which gradually becomes more marked. It is bilateral and symmetrical. The earliest case reported was 2½ years of age, the usual onset being 5 to 8 years. The process comes to a standstill after the subcutaneous fat has disappeared; the whole process may be complete in one year. There are no subjective symptoms.

On autopsy the affected parts show marked diminution to total disappearance of subcutaneous fat. There remains a moderate amount of fat in the gluteal region, orbits, omentum, about kidneys, heart, pericardium and under serous membranes; no evidence of tuberculosis anywhere. In this disease the fat, when once it disappears, never returns; but as the patient grows older the subcutaneous connective tissue probably increases somewhat and the emaciation of the face is less conspicuous.

SUMMARY OF CASES REPORTED IN LITERATURE.

Author	Sex	Age	Age at Onset	Parts affected	Remarks
1. Husler.....	M	10	6	face	
2. Husler.....	M	9	6½	face, neck	
3. Shaw.......	M	10	2½	face	Bilateral atrophy of face
4. Weber.....	M	13	8	arms, neck	Putting on weight in legs and neck

5. Gerstman...	M	32	10	down to pelvic bones	
6. Gerhartz....	M	29	67		
7. Hertz and Johnson....	M	26	24	face	
8. Hertz and Johnson....	M	38	37½	face	
9. Campbell...	F	21	6	down to pelvic bones	Abundant fat in buttock and lower extremities
10. Feer.......	F	12	6	face, neck, arm, thorax	Excess of subcutaneous fat in lower extremities and buttocks.
11. Hertz and Johnson....	F	27	16	down to pelvic bones	
12. Christiansen	F	18	12	face, trunk, arms	Excess of subcutaneous fat in lower part of trunk and lower extremities and buttocks. Paraffin injections tried
13. Cohen......	F	17	6	down to pelvic bones	Excess of subcutaneous fat in buttocks.
14. Simons and Hollander..	F	21	11	down to pelvic bones	Excess of fat in buttocks and lower extremities. Increase in size of gluteal region noted at 5 years. Human fat tried for cosmetic purposes.
15. Epler......	F	7	2½	face, neck, arms, body	Scapulae prominent, legs plump. One of twins.
16. Spear......	F	15	8-9	down to pelvic bones	Hips, thighs, legs remained plump.
17. Bossert-Rollert.....	F	11	4	face, chest, abdomen	Following fright.
18. Weber.....	F	12½	7½	down to pelves	
19. Tramer.....	F	11½	9	face and arms	
20. Barraquer..	F	25	13	face, upper part of thorax	Began after influenza
21. Simons.....	F	Young woman	2	face, trunk	Arms normal, buttocks overloaded with fat.
22. Laiguel Lavastine..	F	39	22	face, neck, chest, upper part of body	Excess of subcutaneous fat in lower extremities—buttocks increase of fat first noted in legs at 22 years.
23. Pic and Gardere....	F	2	2	down to umbibicus	Pseudo-hypertrophy of pelvic region and lower extremities. Rest and feeding caused increase of fat in lower extremities alone.
24. Herrman...	F	32	67	down to pelvis	After marriage lower part of body began to get stouter—not upper part.
25. Weber......	F	30	7	face, neck	
26. Weber.....	F	19	8½	face, upper part of body	
27. Cautley.....	F	24	6	face, upper part of body	

REFERENCES

1. 2. Husler: Ztsch. f. Kinderh., 1914, X, p. 116.
3. Shaw: Tr. Clin. Soc., London, 1905, 38, p. 222.
4. Weber: Br. Jour. Child. Dis., 1917, 14, p. 179.
5. Gerstman: Wien. Klin. Wochens., 1916, 29, p. 1209.
6. Gerhartz: Munch. Med. Woch., 1916, 62, p. 823.
7. 8. Hertz and Johnson: Proc., Roy. Soc. Med. (Clin. sec.), 1913, p. 92.
9. Campbell: Trans. Cl. Soc., London, 1907, XI, p. 272.
10. Feer: Jahrb. f. Kinderh., 1915, 82, p. 1.
11. Hertz and Johnson: Br. M. Jour., 1913, p. 1154.
12. Christiansen: Hosp. Ted. Coben., 1914, p. 57.
13. Cohen: Berl. Wochens., 1913, 50, p. 1322.
14. Simons and Hollander: Ztsch. f. d. ges. Neurol. and Psy., 1911, 29; 1913, 19, p. 377.
15. Epler: Mich. Med. Soc., 1918, 17, p. 356.
16. Spear: Arch. Int. Med., 1918, 22, p. 39.
17. Bossert and Rollert: Mon. f. Kinderh., 1917, 14, p. 230.
18. Weber: Proc. Roy. Soc. Med., 1918, 12, p. 13
19. Tramer: Mon. f. Kinderb., 1918, 15, p. 397.
20. Barraquer: Abst. Neurol. Centr., 1907, p. 107.
21. Simons: Klin. Woch., 1913, p. 1454.
22. Laiguel: Nonv. inconog. de la Salp., 1912, 25, p. 473.
23. Pic and Gardere: Lyon Med., 1909, 113, p. 61.
24. Herrman: Arcb. Int. Med., 1917.
25. 26. Weber: Quart. Jour. Med., 1917, p. 131.
27. Cautley: Proc. Harveian Society, London.

Mark S. Reuben and Harry O. Zamkin.

Case No. 25.[*] Male, 18 months old.

This case may be of interest, not because of the rarity of the condition (100 cases since 1914), but because usually it is not recognized as a clinical entity.

Edmund A., age 18 months, was brought to the out-patient department of St. Christopher's Hospital for Babies April 19, 1921.

Complaint. (1) Restlessness, irritability and insomnia. (2) Diffuse redness and swelling of the hands and feet, which are always very cold. (3) Constant low fever, and profuse sweats. (4) Itching of the whole body, but especially of the hands and feet.

Family History. Only child of healthy parents. No history of exposure to tuberculosis. No history of similar disease in family. No history of lues.

Birth History. He was born at 9 months by difficult forceps delivery, November 22, 1919. There were minor scalp injuries with no evident after-effects. Birth weight, 7½ pounds.

Feeding History. Breast fed 10 days with resultant loss of 2 pounds. He was then given supplementary feedings of whole milk dilutions. He gained consistently for 8 months, when he was given in addition to whole milk, cereals and vegetables. To this diet was gradually added broths, fruits, custards, etc. Orange juice was given from about 4 months of age to date.

---

[*] A case of erythroedema.

Developmental History. Sat up at 8 months; walked at 12-14 months; first tooth at 6 months; 16 teeth to date; speaks a few words; was an even-dispositioned, alert, happy infant up to onset of present illness.

Past Illnesses. None.

Present Illness. Began gradually 2 months ago with a small papular eruption on the hands, accompanied by itching which was soon followed by a diffuse redness and swelling of the hands. There was fever at this time, profuse sweating and marked changes in disposition; he became very restless and irritable, and was unable to sleep at night. Soon his feet became red and swollen, the itching becoming most severe, and unrelieved by any medication. When he was not scratching or rubbing his hands and feet, he was constantly pulling at his ears. All this time his hands and feet, though apparently inflamed, were cold and clammy. The child assumed an attitude with his head as near his feet as possible. In bed he would assume a crouching attitude, with head down in the pillow and whining almost continuously.

His appetite had been good. There had been no vomiting; bowels were regular, occasionally foul. He had no symptoms referable to the heart and lungs. He had occasional frequency, but no hematuria or dysuria. He has had continuous low fever and has become progressively worse.

Physical Examination.

General Appearance. He is a small well-nourished infant; looks extremely unhappy and uncomfortable, sitting on the table with his body bent forward, his head drooping forward, a frown on his face and rubbing his feet with his hands, picking at his toes, and whining continuously. The red, swollen appearance of his hands and feet strikes one immediately.

His head is well formed. Fontanels closed. The eyes are negative; pupils react to light and are equal. There is no congestion of ear drums. There is no nasal discharge and no congestion of the pharyngeal or buccal mucosa. The tonsils are not enlarged nor congested. The tongue is clean.

There is apparent weakness of the muscles of the neck allowing the head to droop forward. The heart and lungs are negative. The abdomen is soft; no tenderness, and no abnormal masses felt. Liver and spleen are just palpable at costal margin. The genitals are normal except for a phimosis. There is slight enlargement of the axillary and inguinal glands. The extremities are negative except for the skin lesions. The reflexes are normal. The skin of the trunk is smooth and moist except for slight excoriation of buttocks. There is a diffuse erythema and swelling of the hands with no sharp line of demarcation. They are not tender and there is no pitting on pressure. They are quite cold and moist. The feet are similarly involved, but in addition there is a vesicular eruption on the erythematous background. (The skin of the feet has a macerated appearance). The nail of the great toe of the left foot is loose.

LABORATORY DATA.

Blood. Hgb. 94 per cent. (Sahli). R.B.C., 5,650,000; W.B.C., 8,100. Polys. 54 per cent.; Lymphocytes, 45 per cent.; Eosinophiles, 1 per cent.

Blood Culture. Negative.

Blood Wassermann. Negative.

Blood Chemistry. Sugar .111, urea 33.8, uric acid 2., creatinin 1.145, urea-nitrogen 15.8.

Urine. Negative.

Von Pirquet. Negative.

Stools. Brown, pasty, smooth. Negative for ova and parasites. Culture negative for typhoid and dysentery bacilli.

The following protein sensitization tests were made: Whole milk, pea, lactalbumin, spinach, egg yolk, lettuce, barley, potato, wheat globulin, wheat gliadin, oats, rice, dog hair, horse dander, cat hair, chicken feathers. All were negative.

Whole egg, whole wheat and beef gave faintly positive reactions.

COURSE IN HOSPITAL. With continuous wet dressings of calamine lotion, there was marked improvement in the local lesions, the hands and feet became warm, the itching was considerably relieved, and the swelling diminished. For a day or two the child was much less irritable and restless, and with sedatives was able to sleep part of the night. The excoriation of the buttocks became worse and resembled somewhat the macerated appearance of the feet. Anorexia was marked. He had fever throughout his stay in the hospital, his temperature ranging from 98° to 104.6° and accompanied by aggravation of the symptoms during its rise.

He was discharged on the 27th of April, after being in the hospital 8 days, without improvement except in the local conditions of the hands and feet.

Treatment. Calamine lotion locally; bran bath every day; sedatives by mouth.

Diet. Milk, cereal, fruit and vegetables.

Diagnosis. Pellagra, acrodynia, or epidemic erythema, and erythroedema have to be considered. This case has few points in common with pellagra and many which serve to differentiate it from that disease. Here we are dealing with a disease that has already run a course of 2 months and is apparently progressing. There is no pigmentation, thickening of the skin nor sharp line of demarcation. There is no history of any deficiency in the diet and there are no digestive disturbances except anorexia.

Acrodynia, or epidemic erythema, occurred first in Paris in 1828 attacking about 40,000 persons. It has some points in common with our case, but it is a disease of adults, as a rule runs an afebrile course from 2 to 4 weeks, is accompanied by vomiting, diarrhea, marked conjunctival injection and frequently cramps, spasm, tetanic contractures and sometimes general anasarca. We do not have such manifestations in this case. Weston, in the ARCHIVES OF PEDIATRICS September, 1920, describes a disease very similar to this case which he calls acrodynia. He quotes extensively from the literature about acrodynia but I fail to see a close enough resemblance in his cases to acrodynia to warrant that diagnosis. In the first place his cases were all under 6 years of age; secondly, the course of the disease in the one case he reported in detail is months rather than weeks.

As mentioned by Byfield, in his paper entitled "A Polyneuritic Syndrome Resembling Pellagra-Acrodynia(?) Seen in Very Young Children," American Journal of Diseases of Children, November, 1920, other diseases which have points in common with the disease in question are beri-beri, arsenic poisoning, the trophoneuroses, acroparesthesia and erythemomelalgia, but there is no difficulty in eliminating them as possibilities in the diagnosis of the case here reported.

In 1914 Dr. H. Swift read a paper before the section of Diseases of Children at the Australian Medical Congress, in which he described, under the term erythroedema, a sympton complex occurring in young children characterized by extreme fretfulness, neuromuscular disturbance, sleeplessness, and a red rash involving the hands and feet, and at times other parts of the body.

The most recent report comes from Wood in the Medical Journal of Australia, February 19, 1921. His paper entitled "Erythroedema" is based on 88 cases. His cases were collected subsequent to the publication of Swift's paper and Wood considers them to be the same disease as that described by Swift in 1914. There is no question in my mind that Weston's and Byfield's cases, as well as the one here reported, are likewise erythroedema, and my conclusion is based on the following points: (1) All the cases occur in infants or young children. (2) All present the most extreme picture of abject wretchedness, irritability, restlessness and insomnia. (3) The red, swollen appearance of the itching hands and feet stands out as the striking feature in most of the cases. Byfield writes of one case, "the hands and feet seem to have been 'dipped in boiling water.'" Wood states that in some cases the red swollen appearance of the hands is an early symptom, and if present is absolutely pathognomonic of erythroedema. (4) Marked coldness of the hands and feet in all cases. Weston writes of his 8 cases that all had swollen, cold, bluish-red feet and hands. (5) Anorexia in all cases. (6) Profuse sweating and irritation of the body and (7) Photophobia in the majority of cases.

Each writer is apparently describing the same disease which to my mind is neither pellagra nor acrodynia. It was called erythroedema in 1914 by Swift, who was the first to recognize it as a clinical entity; and it seems to me that a name which so well expresses the most striking feature of the disease, namely, the red, swollen extremities, should be adhered to, at least until we can learn something of the etiology or pathology of the disease, and thereby obtain a basis for a more logical name.

Etiology. The fact that the feeding history in so many of the cases reported is exceptionally good seems to me to rule out a deficiency disease. Von Pirquet tests, blood Wassermanns, blood cultures and most laboratory examinations have been negative.

Byfield suggests that it may be a post-influenzal radiculitis or sensory polyneuritis. A post-mortem examination in one of his cases (complicated with tuberculosis) showed involvement of an occasional anterior horn, all of the spinal cord, gliosis about the central canal and edema of the sensory roots. Swift, however, claims that the majority of cases occur in children who have not previously been attacked by a febrile disturbance like influenza. I believe that Byfield is right in considering it an infection rather than a deficiency disease.

Prognosis. The prognosis for life is very good. Very few of the cases die. The disease is self limited and recovery, as a rule, takes place in from 2 to 18 months. Apparently there are no sequelae, and to date no recurrences have been reported.

Treatment. The course of the disease is but little influenced by treatment except in cases of persistent anorexia, where forced feeding is a life-saving measure. Sedatives and hypnotics are necessary to produce sleep; calamine lotion seems to be the favorite local application to the hands and feet and the one which gives the greatest relief. Wood advocates open air treatment day and night.

MANNING C. FIELD.

ANAPHYLAXIS TO BREAST MILK (Archives de Médecine des Enfants, Paris, Sept., 1921). The infant and parents were healthy but the child had had diarrhea from the fourth day after birth onward, coming on each time, with colic, an hour after the breast feeding. When given other food it had no diarrhea, but the fetid diarrhea followed each breast feeding. When the child was nearly 5 months old, Sztark injected into the abdominal wall 1 c.c. of the mother's milk, and three more injections of 2 c.c. each were given in the course of a month. This seemed to desensitize the child, and it had no further digestive disturbance. In a second case of the kind, a single injection of 5 c.c. of the mother's milk answered the purpose. Nothing but water was allowed for six hours after the injections. He adds that in cases of digestive disturbance in breast fed infants, one or two injections of the mother's milk is the touchstone. He has never witnessed any harm result from the injections of milk in infants or adults (asthma, hysteria, tuberculosis).—*Journal A. M. A.*

SOCIETY REPORT

THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Stated Meeting, Held October 13, 1921.

Miner C. Hill, M.D., *in the chair.*

RITTER'S DISEASE WITH A FATAL TERMINATION FOLLOWING TONSILLECTOMY.

Dr. James Hoyt Kerley read this paper. (To be published in a later number of Archives.)

Discussion. Dr Henry Koplik stated that he had seen this case and therefore might say a few words about it. It was a case of the kind he has seen in infants, though this child was 2 years of age. The condition as described by Ritter was really a septic condition which was observed in the Foundling Hospital in Prague. Epstein, the chief of the service, later made the statement that this disease was gradually disappearing from the institution. In other words, that as hygiene conditions improved Ritter's disease went out. The name Ritter's disease should be confined to the condition described by Ritter, but Dr. Kerley's case so closely resembled Ritter's disease and followed tonsillectomy and otitis media that it seemed proper to give it this name. It was the only case of the kind he had seen in a child of this age. Dr. Koplik stated that about 50 per cent. of the cases among the new born recovered.

WHEN SHALL THE MEMBRANA TYMPANI BE INCISED, AND WHEN IS RE-INCISION INDICATED?

Dr. Walter Lester Carr read this paper. (See page 91.)

Discussion. Dr. John R. Page said that Dr. Carr had stated the situation very well indeed from the standpoint of the otologist and that he had no disagreement with the views expressed. He had been led to believe that most pediatrists were decidedly less radical—if those statements were considered radical. The otologist and the pediatrist disagreed on this question for the same reason that they did not always agree as to when it was best to open a mastoid, and this was quite natural. The ear man, from his association with complicated cases, has the danger of delay impressed upon him so forcibly that he would rather chance erring on the safe side than open too late, feeling, as he does, that harm practically never results from an early paracentesis. The pediatrist doubts this, and advances as an argument against it the danger of infection from outside, having in mind when he does, not a paracentesis but a free incision for drainage —a U-shaped incision, so much talked about but so seldom performed—while the ear man has not this in mind at all. He looks at the ear drum, and if he sees evidence of marked involvement, with infection, he makes a free incision from below upward in the posterior part of the membrane and evacuates the contents; but if he finds the membrane retracted and reddened, with the patient in pain, he does a paracentesis (nothing more) with a small knife, which is sufficient to relieve the pain and let any extravasated serum that may be present escape. The early cases of otitis media have a negative pressure in the tympanum and in some cases the pain is as acute at this stage as it is in others from fluid under pressure. Just as a dry cup produces a hyperemia of the skin and, if its use is prolonged, hemorrhage and exudation, so will negative pressure in the tympanum cause swelling and congestion of the mucous lining and extravasation into the cavity. A minute opening into such a drum relieves the situation immediately and almost invariably. The chance of carrying infection through a thin membrane into such an air chamber with a sterile knife is very slight and not to be compared with the danger of lumbar puncture, so often considered harmless. Of course, if a U-shaped flap is going to be made and a fluid syringed through into the throat, as some think advisable, any careful man would rather take the chances with nature than to subject the child to such heroic treatment.

In any case in which the membrane can be seen through a speculum, the canal can be cleansed and filled with alcohol and the drum entered with the point of a small sterile knife with no more danger of outside infection than in a lumbar puncture, and it is surprising to learn that beyond the knife and the speculum these precautions are not always regarded as necessary by some who perform myringotomies.

In cases where the canal is so swollen that the membrane can hardly be seen and the knife has to be passed in contact with the posterior wall as a guide and the drum opened blindly, then of course there is a greater chance for infection, but these are cases in which the process is usually well established and there is little doubt of the necessity for incision. Still, even where the swelling is marked, packing the canal with cotton moistened in alcohol and allowing it to remain in place for 5 minutes will squeeze out the edema and give a good view more often than is realized by many.

A paracentesis or myringotomy cannot be performed satisfactorily, with the infant held in the upright position, for in that position one cannot properly see what he is doing nor properly cleanse the canal; and if the child when tightly swathed cannot be held still on the table, it can be given a little whiff of chloroform unless there is some very positive reason to the contrary.

Dr. Page said that the efficacy of the simple puncture done early had been demonstrated more than once in his own family when he was on hand at the beginning of the trouble; and in one instance the danger from delay was also demonstrated when his child, being away from home, a double otitis developed, as it had done before on several occasions; this time it was allowed to become established because a very good doctor, for 48 hours, thought the membrane was not bulging sufficiently to warrant opening. A double mastoiditis developed which barely escaped operation, and marked impairment of hearing and tinnitus persisted for months.

Dr. Page did not wish it to be understood that he opened every drum membrane that he met. On the contrary, he frequently advises waiting, but keeps in close touch with such patients and will not allow the ear to be irrigated with hot water so as to render it impossible to tell how much the increased redness is due to the hot water at 110°. It is fortunate for patients that the direction for hot irrigations are usually so poorly carried out that the water does not reach the drum, for it is liable to make them dizzy and seasick from the caloric action on the labyrinth. The canals, however, are usually swollen by it and it creates doubt about the membrane itself. A hot water bag masks matters less and, while it does not divert the patient to the same extent, it probably affords as much relief.

Dr. Page said further that he wished he were able to get as much relief through intranasal drops of adrenalin, argyrol, etc., that some seem to secure. Despite the opposition, he felt that he obtained more certain ventilation of the drum and more prompt relief from pain by the small, precise, careful and—as Dr. Gruening used to say, "in my hands"—harmless perforation of the drum.

In regard to re-incision, it may be necessary a day or two after the first paracentesis if, in an ear where the infection is well established, the drainage is insufficient and there is some doubt as to whether a proper incision was made to meet the condition in the first place. It can do no harm and it frequently does good; but repeated incisions made simply because the drum bulges are useless in a well infected ear. A membrane can be cut to ribbons and it will still bulge, not from retention but from swollen mucosa in the region of the additus and from granulations in the tympanum.

Without invading the topic to be discussed later, Dr. Page said that a word about persistently discharging ears was justified just here, and he appealed to the pediatrists in hospital practice to note all running ears in children that have been cured of the various diseases for which they were admitted; and urged that the house physician should stamp on the cards of these patients that they have a purulent otitis media and should be referred by the office to a proper place for observation and treatment. If this were done there would be fewer cases turning up with the membranes sloughed out by prolonged discharge.

LIMITATIONS OF THE RE-INCISION OF THE TYMPANIC MEMBRANE.

Dr. Samuel Kopetzky and Dr. Alfred A. Schwartz read this paper. (See page 86.)

Discussion. Dr. Miner C. Hill said they had formerly been taught that whenever there was a bulging drum membrane, with elevation of temperature and pain, the drum membrane should be incised. In children pain was not always manifested unless it might be by irritability. Again some drum membranes that required incision were retracted as well as bulging. During the epidemic of influenza he had seen at least a hundred of these cases of otitis media with slight bulging that cleared up without incision.

Dr. Wendell C. Phillips mentioned 2 points in connection with the remarks made by Dr Page and the reader of the first paper in reference to the subject of paracentesis that he said he felt could be brought out in a clearer manner. He regretted that he could not follow Dr. Page in all his contentions. He had been led to believe by long experience that there were 2 distinct types of middle ear involvement not only in children but in adults. There was one with severe, lancinating pain, which caused a baby to cry out and an adult to say he was suffering considerable pain, temperature and a bulging of the drum membrane. This was the purulent type. The other type was the catarrhal type in which the symptoms were not marked. It was usually caused by an obstruction, there was negative pressure and a retracted ear drum. One should keep the knife away from this type. In the purulent type the drum membrane was usually red, but not always, and this type should always have paracentesis. Dr. Phillips said that being a teacher he was apt to be arbitrary in what he said; it was his opinion that catarrhal otitis was always catarrhal otitis and never became purulent, while purulent otitis media was always purulent and never became catarrhal until cured by paracentesis. As a rule, purulent cases did not get much relief from repeated paracentesis. If incision did not do its work at first, as a rule it never would do it. By this he did not mean that one should never do a second paracentesis, for all otologists occasionally had to make a second incision to comply with the insistent requests of the family, but in such cases it was simply a postponement of the time when an operation for mastoiditis had to be performed.

Dr. L. E. La Fétra said it always seemed to him that the otologists took a very pessimistic view when they saw a bulging drum membrane. He was sure all would agree that if a child had a high temperature and a bulging of the ear drum persisting beyond 24 hours, and with these signs increasing, that the drum membrane ought to be incised. But many red, swollen and bulging ear drums cleared up without incision even when the bulging was distinct in all parts of the drum membrane, so that bulging is not an absolute indication for paracentesis; he understood fully the danger of fulminating mastoiditis and its complications. He had had a large experience with otitis media with the mastoid tip involved and he had seen many clear up without incision of the drum, so he could not subscribe to the early incision. If, however, after 24 hours the bulging and temperature had increased, one should not wait any longer because the danger of mastoiditis was so much greater than the danger of simple incision of the drum that no one should hesitate as to which to choose. In regard to second incisions of the drum membrane, Dr. La Fétra said he was inclined to agree with the otologists that if one made a free incision the first time and there was very little discharge, together with a persistence of the symptoms, one must look for trouble in the mastoid. If the incision became small and the discharge persisted, re-incision is indicated. One thing must be emphasized, and that was that in children a vacillating temperature, high leucocyte count and high polymorphonuclear count did not necessarily mean mastoiditis nor did it mean sinus thrombosis. One must be guided by other symptoms than the temperature and blood count, particularly in influenza otitis. The indications for mastoid or sinus complications should be found in the otological manifestations and in the results of successive blood examinations rather than in the course of the temperature.

Dr. Charles Hendee Smith said that in regard to the cases that needed re-incision he agreed with the otologist that one should not make 2 or 3 incisions within the first 2 or 3 days simply on account of a persistent fever. There were cases, however, in which the drum healed before the otitis had entirely cleared up. He had seen such cases which at the end of some days required re-incision, and after re-incision cleared up without mastoiditis.

Dr. Henry Koplik said he examined every ear. One met with cases of otitis without temperature, some with absolutely no temperature above 100°, and the babies were quite sick. There might be bulging of the drum, but sometimes pus was present with very little bulging; and the child had a temperature of 98½° and in others a serous exudate. In some cases the ear did not bulge but was a little flat and there was a distinct pus reflex. Why allow the baby to lie for 24 hours waiting for relief? If the drum was bulging he would not hesitate to incise it and incise it freely, although in a great many cases the exudate resolved if the drum was left alone. However, if pus was there, even if the drum was not bulging, if left to resolve, the hearing might be impaired. He thought the otologist would recollect having seen cases in which the drum was flat and yet there was pus in the ear. As to re-incision he had had many cases in which a mastoid operation had been advised and rejected by the parents and re-incision had cured them with a very good drum and the children were perfectly well afterward. There were cases that would get well with re-incision and cases that would not. In order to distinguish between these classes one must have large experience and judge every case as an entity. There was no rule as to incision of the eardrum.

Dr. Francis J. Quinlan said he thought the time was ripe for a discussion of this kind, which should have not so much the enthusiasm of youth as the wisdom of age. He had heard what Dr. Page had said with much satisfaction and a little suspicion. He had spoken of ear ache at night. In years gone by he had seen many cases of ear ache due to the recumbent position which favored obstruction of the eustachian tube. The tubal membrane became congested and there was hyperemia of Schrapnell's membrane. That condition did not need incision. For all incision of the drum membrane was said to be a very simple procedure it might cause luxation of the stirrup and dislocation of the incus; accidents of that kind had happened even in the hands of great experts. By applications one might expedite the depletion of the muscles of the eustachian tube and the capillaries of Rosenmüller's fossa and reëstablish the normal circulation of the ear. When the drum was pushed downward and forward and there was evidence of the presence of pus it was timely to incise.

Dr. Sidney V. Haas said it took some courage to speak against early paracentesis. Dr. La Fětra and Dr. Quinlan had advocated conservatism, and he would like to tell something of his personal experience beginning 15 years ago. It was taught at that time that unless the drum was incised early a mastoid operation would probably become necessary. In one family there were 3 cases of otitis media which were opened within the first 24 hours, and 2 of these had to have a mastoidectomy. That made him believe that if one waited for a short period it might be no worse. From that time he began to wait, increasing the intervals, and at the end of 10 years he had no hesitation in waiting days. He was sure *early* paracentesis was not only not indicated but actually harmful. It was better to wait 3, 4, or 5 days than to make the incision within the first 24 hours. For the pain there was nothing that worked better than opium. Certainly the taking of an anesthetic was as bad as the short period of pain, which could be relieved by paregoric. Incidentally, the primary pain, when relieved, only rarely recurred. He was speaking not only of congested ear drums but also of tender mastoids in patients with a high temperature. Dr. Page would perhaps recall a case that they had seen together. Dr. Page was called in on the fourth or fifth day to do a myringotomy and had objected greatly to the delay. The infection in this case was a *streptococcus mucosus,* and although the mastoids were involved they cleared up quickly. In the last 4 or 5 years he had not had a case of operative mastoiditis by following this policy of waiting. This did not mean that he would not have any cases of operative mastoiditis, but it did show that complications were not incurred by waiting. It was quite remarkable to see how these bulging and inflamed drums would subside without incision under hexamethylenamine and argyrol. Finally, one could judge by the appearance of the nasopharynx as to the progress of the process in the ear. The temperature dropped to normal long before the bulging subsided. The improvement in hearing was also a guide as to the conditions existing in the middle ear. There had been no case of later impairment of function.

DR. SEYMOUR OPPENHEIMER expressed the opinion that they ought to be able to strike a sane attitude on this subject. In his judgment myringotomy was performed too frequently. He observed so often that in children admitted to his hospital service with some pulmonary infection or some intestinal disturbance, almost uniformly the ear drums had been opened by the house staff or visiting staff. Most of these cases had reddened drums, but that did not indicate the necessity for myringotomy. The only indication is the evidence of an exudate in the middle ear space; indication may occur on the first, second or even the tenth day. The temperature does not enter into it, but it is the appearance of the drum membrane which is the guide. Exudates ofttimes form very rapidly and at the time of examination a myringotomy does not seem necessary, and then some hours later one is mortified to find that a perforation has occurred; that is something that cannot be helped. As to the question of re-incision and its necessity, much depends upon the type of treatment employed after the original myringotomy, provided of course the myringotomy has been properly performed. Unfortunately there is an impression that myringotomy consists in nothing more than a stab. It should be an accurate surgical procedure and properly placed. The after-treatment is most important to keep the perforation patent and the middle ear freed of secretion, and for this purpose the employment of negative pressure by a simple suction apparatus is most satisfactory. If that type of treatment is employed the necessity for re-incision of the drum would be much lessened. Doctor Oppenheimer said he was sorry he could not agree with Dr. Haas. They had been threshing that question out together for many years. While he believed that drum membranes were sometimes opened too early he was not in accord with Dr. Haas's views. The question of the virulence of the particular infection in the individual case is all-important. The question of proper attention to the canal of the ear is of the greatest importance and it is distressing to see men pay such little attention to asepsis and the surgical preparation of the ear canal, and the ear proper, prior to the incision. This brought up the question as whether infection could be carried from without. Dr. Oppenheimer firmly expressed the opinion that it can unless proper aseptic precautions are employed.

Dr. John R. Page said there was as much difference of opinion on the subject of opening the ear drum among otologists themselves as there was between the otologists and the pediatrists, and as much difference of opinion among the pediatrists as among the otologists. There was equal support on both sides of the question from both groups of men.

FACTORS DETERMINING THAT A SIMPLE MASTOIDECTOMY IS INDICATED IN THE NON-ACUTE STAGE OF MIDDLE EAR AND MASTOID INFECTION.

DR. HENRY KOPLIK read this paper.

A FURTHER REPORT ON THE TREATMENT OF PERSISTENT OTORRHEA IN INFANTS AND YOUNG CHILDREN BY THE ESTABLISHMENT OF POSTAURICULAR DRAINAGE.

DR. WENDELL C. PHILLIPS presented this communication. He stated that 8 years ago he had had occasion to outline the results of a series of studies regarding the more or less chronic purulent middle ear suppurations occurring during infancy and early childhood. Those studies were based on a large clinical experience, both in private practice and in his various hospital services. At that time he defined 2 distinct types of this particular affection as follows: (a) The persistent type and (b) the recurrent type. The persistent type applied to those cases in which an acute purulent inflammatory process invaded the middle ear spaces, and continued without abatement for an indeterminate period after the usual 5 to 30 days, which ordinarily might be considered as its normal course. This type of purulent otitis media should be clearly differentiated from the most common and recurrent type in which recovery usually took place from each attack only to be followed by recurrence at varying intervals, or whenever the child became the victim of an acute nasal infection. In the recurrent type the children were almost invariably victims of diseased tonsils and adenoids, and their attacks usually ceased upon the removal of these offending tissues. The recurrent type, therefore, might be eliminated from this discussion inasmuch as it hardly might be classified as non-acute in character unless, as a result of neglect to remove the diseased tonsils and adenoids, the otorrhea might finally become persistent and chronic in character. The persistent type of cases furnished a history somewhat as follows: During the course of an infection involving the upper air passages, or as a complication of certain chronic diseases, an acute ear suppuration appeared. Weakened by the primary general acute infection, the child's resistance became lowered and in many instances it was probable that some underlying dyscrasia, known or unknown, played its part. Ear ache followed which might be relieved by a paracentesis, and from the onset the discharge was profuse, persistent and of a character which plainly bespoke a severe type of infection. Mastoid tenderness was present and positive during the first few days, but might gradually disappear, unless the case was destined to become an acute mastoiditis requiring immediate operation A large percentage of cases, however, showed a moderate diminution in the quantity of the discharge from the third to the seventh day, but it never entirely ceased. The temperature might gradually become normal, or nearly so, pain was not present thereafter as a prominent symptom, and there might be no marked drooping of the posterior-superior canal wall. The usual local measures of treatment consisting of paracentesis, cleansing, catharsis, and rest in bed might have been carried out, but often clinic patients had received no treatment at all. In short, the case became one of chronic purulent otitis media, its significance being otorrhea which continued without abatement. To the observer it became evident that the small tympanic cavity proper could not secrete the amount of pus which flowed from the ear, and that the mastoid antrum at least must be involved in the inflammatory process. Furthermore, it was evident that when such a discharge continued for a period beyond the end of the fourth week the element of chronicity had become established. It was also true that proportionately a large number of these persistent otorrheas occurred among the poor and ill-nourished applying for treatment in the hospitals and dispensaries.

Of the underlying dyscrasias which served to prevent nature's efforts at repair, tuberculosis and syphilis were the most stubborn to deal with. Examinations of the discharge and scrapings from a considerable number of this type of patients were examined for tuberculosis with positive results, even in cases in which no evidence of general tuberculosis existed. In this particular type of otorrhea even the removal of the tonsils and adenoids did not serve to terminate the aural discharge; neither did repeated paracentesis serve any purpose. The disease remained chronic and unless relieved by surgical measures it progressed for long periods with serious impairment of hearing and often with fatal complications. It might be true that after long periods, even years, some of these cases did discharge spontaneously, but not until after extensive destruction had taken place with permanent impairment of the hearing.

Regarding the treatment: All reasonable measures should be faithfully carried out for a reasonable period, which might be for a month to 6 weeks, this to include free drainage by paracentesis, a clean regime of local treatment and attention to hygiene and general health. All these measures having failed, it was the writer's opinion that the quickest, safest and most rational measure to pursue was to establish postauricular, and hence, through and through drainage by means of the simple mastoid operation. This was his conviction expressed 8 years ago, and this opinion was based upon 20 or 25 operations. The lapse of years and the further study of cases, together with 100 operations performed by himself and his assistants, had in no way changed this conviction. In well defined cases of chronic otorrhea of the type above described, he had never failed to find disease of the mastoid process, and had rarely failed to note the free escape of pus through the opening in the cortex at the time of operation. It must be remembered that these cases failed to exhibit almost all of the classical symptoms of mastoid involvement, except the discharge; yet upon operation all furnished evidences of extensive disease of the mastoid cells. Briefly stated, the reasons for advocating the simple operation in these cases were as follows: (1) It quickly terminated an otherwise persistent otorrhea; (2) It insured against an extension of local bone necrosis; (3) It relieved the patient of the dangers of possible serious and fatal complications, such as meningitis, brain abscess, and lateral sinus thrombosis; (4) Finally, the most important reason of all was the retention of the hearing function. It was scarcely necessary to add that this operation was not a dangerous one; neither was its slight seriousness to be compared with the dangers and discomforts attending a chronic aural discharge, and particularly the threatened deafness. It should be added that in the more chronic cases the simple mastoid operation had occasionally proven insufficient and a subsequent radical operation had become necessary.

Discussion. DR. EDWARD L. MEIERHOF propounded the question: "When has an infection of the middle ear accompanied by a flow of pus become acute in an infant or a young child? Is this to be determined by the absence of reactionary symptoms, principally fever and evidences of pain, either spontaneous or induced by pressure over the mastoid, or by traction upon the auricle, sometimes accompanied by restlessness during the sleeping period? If such be the case, one would have to wait a very long time in many cases before the non-acute stage has arrived, or should one be governed by the element of time?" The time element must be considered, because some cases will run their course and recover in from one to 3 weeks, even when untreated or badly treated. Also cases may recover after many weeks of purulent activity. Perhaps after 3 or 4 weeks of inflammation which has not subsided, the non-acute stage has begun.

Referring to mastoid involvement, Dr. Meierhof said that in his judgment every infection of the middle ear, especially in infancy or early childhood, involves the mastoid antrum. Many knew of cases where there were distinct evidences of mastoid involvement which had recovered, operation having been advised but refused. However, cases are seen where there has been a pyogenic disease of the middle ear for many weeks or months, before coming under observation. What should be the course in these cases? If the patient has no urgent symptoms and has not been properly treated according to one's judgment, then the child should be given the benefit of such treatment as has yielded successful results. If the case shows no signs of improving within a few days, no time should be lost in opening the mastoid, whether there be symptoms of mastoid development or not. The time has passed when the advisability of opening the mastoid is dependent upon vital indications. The preservation of hearing alone is sufficient ground for arresting the destructive pyogenic process, especially so when due to violent types of infection occurring in the course of scarlet fever, diphtheria, pneumonia, and other infectious diseases. Even a staphylococcus infection in a non-resistant individual can be as destructive as the more virulent types in others.

In trained hands the danger from opening the mastoid is reduced almost to a minimum, but in spite of this we still have to encounter the fear and prejudice of an operation on the part of the family and, knowing this, we often postpone telling them what our real judgment is. Of course, where symptoms are urgent, there is usually no difficulty in obtaining consent, but there are borderland cases that would do better if the mastoid were opened, even though recovery might take place without operation, whether in the acute or non-acute stage. It is just these cases which give rise to discussion, especially with private patients. In hospital practice one is more free to act according to his judgment. Then, what are the factors that give rise to an indication for a simple mastoidectomy in the non-acute stage of middle ear and mastoid infections? If there are evidences of mastoid which are apparent, there is no need for further consideration but one should operate. If the case is one of long standing without mastoid symptoms, but shows no signs of yielding to approved treatment, with or without the presence of symptoms other than discharge, operation is also advisable.

RELATION OF DIARRHEA IN CHILDREN TO OTITIS MEDIA PURULENTA.

Dr. Herman Schwarz read this paper, in which he asserted that over 90 per cent. of the cases, usually classed as gastrointestinal and associated with fever of 1, 2 or 3 days duration, had primarily nothing to do with the intestines. The intestinal symptoms were all secondary. One never met with a temperature due directly to the intestinal condition unless there was blood and mucus in the stools. If a child had an otitis media and diarrhea, mucus in the stools and vomiting, the rise in temperature was not caused by the intestinal condition but by the otolaryngological condition. Hence in cases of this class the use of cathartics and high irrigations were useless, when the real cause of the trouble was in the ear. Another form of gastrointestinal disturbance was persistent vomiting. He had seen children with an elevation of temperature and vomiting for several days in whom a diagnosis of acidosis was made. These patients did not have diminished carbon dioxide and the hydrogen ion concentration was normal. The condition was not an acidosis but a parenteral condition secondary to otitis media or any other infection. The condition was no different when secondary to otitis than when secondary to other infections. In cases of marasmus, it was well to bear in mind the possibility of an otitis media. The gastrointestinal disturbances associated with otitis media were probably not a real bacterial infection but were more likely due to bacterial toxins or some unexplained form of toxemia. The first symptoms were loss in weight and restlessness with perhaps a slight rise in temperature. If the physician did not look into the child's ears he would probably fail to recognize that the condition was a secondary and not a primary one. When the physician neglected to examine the ears, if the child was an infant, he usually changed the formula. If the child was older, nature usually took care of him. He did not wish to eat. However, it was not necessary to starve children with this type of gastrointestinal disturbance. They could take a fairly well balanced diet. In babies nature reduced the food by the vomiting and diarrhea and we could assist nature by reducing it still more. When the infection cleared up the ability to digest food returned, but in the infant at this stage one should go slowly and wait for the return of appetite. In treating cases of parenteral infection, malt soup was one of the foods that the child took well and one could give it without fear of giving the child a real enteral infection, and in this way bring it gradually to take other foods.

Discussion. DR. TRUMAN L. SAUNDERS said that Dr. Schwarz had so completely discussed the subject that it simply remained for him to emphasize the fact that there was a distinct relationship between otitis media and disorders of the digestive system. This had been forcibly brought to their attention in the clinic. Children were brought to the clinic suffering from disturbances of the digestive apparatus and improvement in the gastrointestinal condition was not noticed until the ear was opened. If this fact was emphasized, we might benefit many of our cases of indigestion if a routine examination of the ears was made. If the ears are involved, the gastrointestinal condition will often clear up after incision of the ear drum without any other special treatment. He therefore made a plea for routine examination of the ears in cases of digestive disturbance in infants and children.

ARCHIVES OF PEDIATRICS

MARCH, 1922

HAROLD RUCKMAN MIXSELL, A.B., M.D., Editor

COLLABORATORS:

L. Emmett Holt, M.D.......New York
W. P. Northrup, M.D........New York
Henry D. Chapin, M.D.......New York
Francis Huber, M.D.........New York
Henry Koplik, M.D..........New York
Rowland G. Freeman, M.D....New York
Walter Lester Carr, M.D...New York
C. G. Kerley, M.D..........New York
L. E. La Fétra, M.D.........New York
Royal Storrs Haynes, M.D...New York
Herbert B. Wilcox, M.D.....New York
Charles Herrman, M.D......New York
Wm. Henry Donnelly, M.D...Brooklyn
Frank H. Richardson, M.D...Brooklyn
Edwin E. Graham, M.D.....Philadelphia
J. P. Crozer Griffith, M.D.Philadelphia
J. C. Gittings, M.D.........Philadelphia
A. Graeme Mitchell, M.D..Philadelphia
Charles A. Fife, M.D......Philadelphia
H. C. Carpenter, M.D.......Philadelphia
I. A. Abt, M.D...............Chicago
William P. Lucas, M.D...San Francisco
R. Langley Porter, M.D..San Francisco
E. C. Fleischner, M.D....San Francisco
Fritz B. Talbot, M.D............Boston
Oscar M. Schloss, M.D. ....Boston
Maynard Ladd, M.D.............Boston
Charles Hunter Dunn, M.D....Boston
Henry I. Bowditch, M.D........Boston
Richard M. Smith, M.D.........Boston
L. R. De Buys, M.D........New Orleans
Robert A. Strong, M.D....New Orleans
John Foote, M.D..........Washington
Joseph S. Wall, M.D......Washington
B. K. Rachford, M.D........Cincinnati
Henry J. Gerstenberger, M.D..Cleveland
Borden S. Veeder, M.D........St. Louis
Frederick W. Schlutz, M.D.Minneapolis
Julius P. Sedgwick, M.D...Minneapolis
William Weston, Jr., M.D. Columbia, S. C.
A. D. Blackader, M.D.........Montreal
Edmund Cautley, M.D........London
G. A. Sutherland, M.D........London
J. D. Rolleston, M.D..........London
J. W. Ballantyne, M.D......Edinburgh
James Carmichael, M.D......Edinburgh
G. A. Wright, M.D..........Manchester

PUBLISHED MONTHLY BY E. B. TREAT & CO., 45 EAST 17TH STREET, NEW YORK.

ORIGINAL COMMUNICATIONS

DENTO-FACIAL MALDEVELOPMENTS AND THEIR CORRECTION.

By Alfred Paul Rogers, D.D.S., M.A.

Boston

Dento-facial maldevelopments are prevalent in children of all civilized races. These defects do not seem to be confined to any class, the children of the rich and middle classes suffering as well as those of the poor. Many children, who are apparently in a state of general bodily health and vigor, are found to be sufferers from dento-facial maldevelopments in varying degrees. It may be said, however, that the severer cases, those which may be regarded as actual deformities, are more apt to be found among children whose life histories show arrested development, following periods of lowered vitality. These maldevelopments may be confined to the teeth and the dental arches, or they may, as in severer cases, involve the contiguous bony structure of the maxilla and mandible and the soft tissue of the face.

In some instances, maldevelopment may be recognized in early childhood before and during the eruption of the deciduous teeth. In other instances, these defects do not become apparent until the period of transition between the shedding of the deciduous teeth and the eruption of the permanent ones.

In many instances, the etiological factors are obscure; their solution seems in a large measure a biological one. When the mechanical factors of development are taken into consideration, it becomes a bio-mechanical and environmental problem.

Heredity as an etiological factor in malocclusion is not yet clearly understood. There is confusion regarding the inherited characteristics in children. Among some, any feature which resembles the parent or grandparent is thought to be inherited, whereas it may be due to a like environment. Yet there are some very clearly defined developments of the jaws and teeth which are, no doubt, germinal in their character, and are, therefore, inherited; but the malformations which we are considering at present are those which seem to be acquired. Even in such cases there are many instances in which the etiological factors are obscure. At present we must blindly set the responsibility for many of these distressing developments upon the environmental surroundings of the child.

"Very slight changes in food, temperature, moisture and atmospheric conditions may produce great changes in the developing organism, and these conditions are for the most part entirely beyond the control of the individual affected."—Conklin.

The child has many habits forced upon him which tend to influence the development of his entire body. Habits of eating in most civilized countries, and especially in America, are such as to limit the functional activity of the parts to their minimum effort. *The stimuli received by the growing jaws, where functional activity is normal for that individual, can not help but develop the organ more nearly to its proper size and strength.*

"Functional activity or use is one of the most important factors of development. Functional activity is response to stimuli, which may be external or internal in origin. The entire process of development may be regarded as an almost endless series of such responses on the part of the organism. . . . It is a truism that use strengthens a part and disuse weakens it; it is likewise a truism that responses which are oft repeated become more rapid and more perfect, and in this way habits are formed." . . . Conklin.

It is sometimes thought that malnutrition has much to do with the malformation of the osseous tissue which forms the framework for the teeth, but investigations in this direction are not yet conclusive enough for final judgment as to the extent of its influence. Research work is being undertaken upon rickety children where certain degrees of maldevelopment have appeared (Sisson). Delayed eruption of the permanent teeth, with its attending evils, seems the chief factor in many of these cases.

There are certain obvious etiological factors of a mechanical nature, among which are the too early shedding of the deciduous teeth, interfering with the growth processes involved in the mechanics of development. Various habits, such as thumb, finger, lip, and tongue sucking, tend to distort the fragile bony tissue which supports the developing dental apparatus. In one type of extreme maldevelopment, thumb sucking is frequently found to be a habit. Any influence which tends to interfere with the functional activity of the oral cavity must be considered an etiological factor in dento-facial maldevelopment. Obstructed nasal passages, enlarged tonsils and adenoids are all such factors, and the pediatrician should ever bear these in mind when directing his attention to the welfare of the child's facial development. It is, therefore, important that he should be familiar with the normal processes of development in the jaws from birth to maturity.

The importance of a well-developed masticatory apparatus is being recognized as a potent factor in the development of the child. The inability to masticate food properly is often a serious handicap that should be of special concern to the pediatrician, for it must frequently hamper him in his efforts. In severer cases we frequently find the enunciation quite seriously impaired, often retarding the child's progress in many directions, and sometimes imparting a suspicion of idiocy to the uninformed. The facial development of the child is often so marred that it proves a distressing impediment in his association with other children and produces an unwelcome reaction upon people in general. I have seen some very distressing cases of this nature which, upon correction, have seemed to relieve the child of a tremendous burden. It is often observed that a child, whose dental-facial maldevelopments, especially when severe, have been corrected, seems at once to enjoy a greater degree of health than formerly.

For many years the attempted correction of these difficulties remained in the hands of the general practitioner of dentistry, and the history of his efforts has been the history of empirical attempts known as the "correction of irregular teeth." In recent years, however, a certain portion of the dental profession have set themselves to the exclusive practice and study of these problems, with the result that quite rapid progress has been made in the art known as orthodontia. Like many other medical procedures, the pendulum has swung too far in one direction, namely, that of mechanical interference. Many children's mouths have been harnessed with the most unscientific and harmful appliances by the orthodontic novice and amateur, with many unsatisfactory results in treatment. Those devoted to the specialty are, at present, settling down to a practice more rational, and are giving recognition to the fact that by the restoration of functional activity these deformities are more easy of correction and in some instances may be prevented.

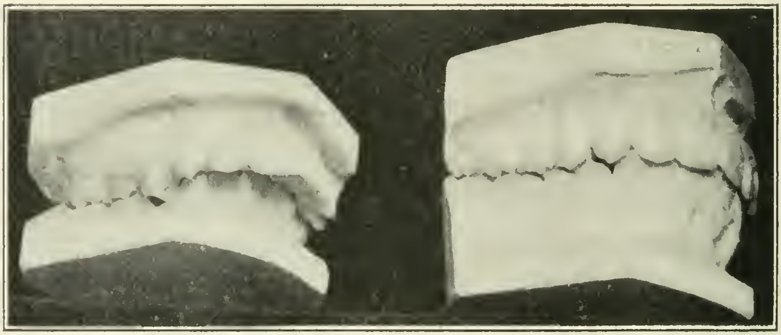


FIG. 1. FIG. 2.

FIG. 1. Represents a severe malocclusion in a child of eleven years.
FIG. 2. Shows the same case as Fig. 1. after the malocclusion had been corrected.

It will be noticed in practically all severe maldevelopments that the muscles of the face and neck,—in fact, the muscles of the en-

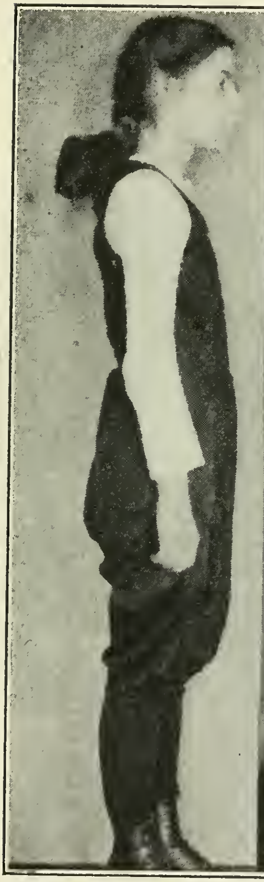


FIG. 3.

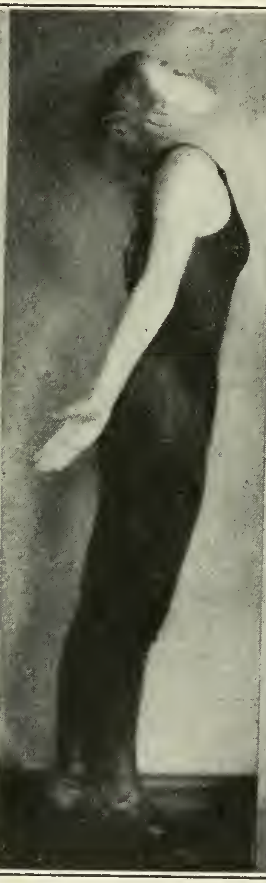


FIG. 4.

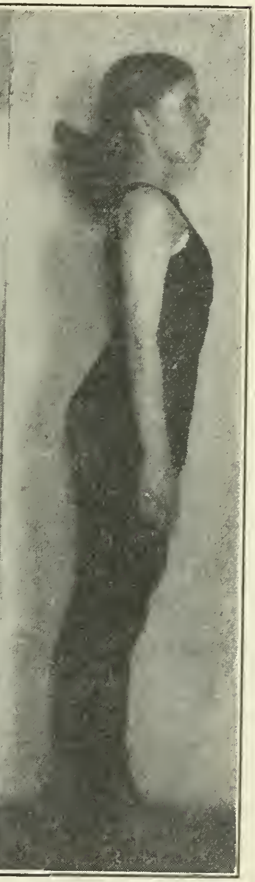


FIG. 5.

FIG. 3. Shows the maldeveloped facial muscles and generally bad bodily mechanics in same child as shown in Fig. 1.

FIG. 4. Shows the same child in one of the exercises given for stimulating general muscular activity.

FIG. 5. Shows the same child after a few months of conscious effort, she having gained, in this time, an increasing facility in muscle control and in general posture.

tire body—are to be found in more or less atonic condition. The task of the dento-facial orthopedist is to study and attend to the mechanical requirements of the case and then to apply such corrective measures as are possible through stimulating the activity of the various groups of the facial muscles. Foremost among these groups may be classed the masseter-temporal group. It is found that by stimulating the activity of these organs a more rapid development of both the upper and lower dental arches may be obtained. *Of course, it must not be forgotten that in stimulating these muscle groups to greater activity and strength, the dental arches must be placed in a position of mechanical advantage or further maldevelopment may be produced. This caution applies to such cases as are considered to be in distal or mesial occlusion.*

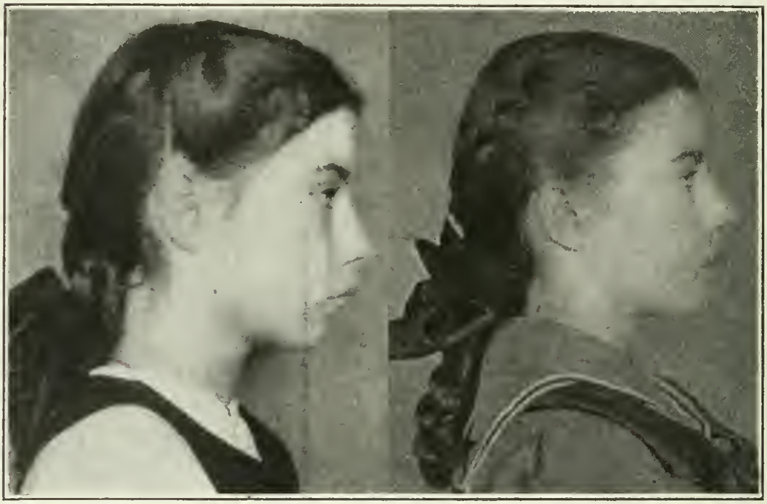


FIG. 6. FIG. 7.

FIG. 6. Shows the same child's face as Fig. 3 before treatment.

FIG. 7. Same child after the malocclusion had been corrected and the facial muscles had responded to the influence of conscious muscular effort. The history of this child's general health and her school record have been most gratifying, having advanced from a state of mediocrity to one of brilliant scholarship. No special change was made in this child's diet.

At the present time, when greater attention is being paid to child welfare, the physician is becoming more interested in the whole organism, and in the future I think there will be better coöperation between the dento-facial orthopedist and all physicians interested in children. The group of men in the dental profession who have advanced to the position where they recognize the important nature of this work are now looking to the pediatrician for aid in the solution of some of their problems. Children come under the observation of the physician at an age when it is possible to recognize the early symptoms and probably get at some of the etiological factors that are at present obscure. It is a painful fact that many children are placed under treatment who are not in a fit physical condition to withstand successfully the efforts of any but the most skilled. The pediatrician may sometimes guard children against the effects of such treatment if he becomes conversant with modern scientific methods. He should know that only in the rarest instances should this treatment give discomfort for any extended period—that continuously sore teeth and surrounding tissue are often indicative of inexperience—seldom should a child be conscious of discomfort in masticating its customary food for more than a few hours after the adjustment of the mechanical apparatus—that frequent visits, covering a long period of time, are not necessary. He should know also that adjustment should not be made more often than once in three or four weeks, and sometimes less frequently, and that during the period between adjustments the child should be free from discomfort. During the progress of disease of any nature, where any slight tax is apt to interfere with the child's comfort, orthodontic procedure which tends to interfere should be abated, at least until the child has passed his convalescence.

Malnourished children respond less quickly to treatment than those properly nourished, and the malnourished are found among all classes of people. Just here is an opportunity for coöperation. The undernourished child, who is suffering from a high degree of irritability, is an unfavorable subject for dento-facial treatment. Yet, in many instances, it is just what the child requires as a preliminary to better health. Under such circumstances the physician may frequently render the child much more receptive to treatment by prescribing a suitable diet and enforcing general rules of health and body building, greatly assisting the child and making it possible for the corrective work to be carried on with greater assurance of success.

The physician should understand that our problem is one of growth and development, and that our efforts must necessarily cover the child's full period of growth; the periods of treatment being intermittent, the teeth not being held in the grip of appliances of any nature for years at a time, therefore not interfering with the efforts that nature might be making on her own account. In developing cases (under 13 or 14 years of age), it should be known that the dento-facial orthopedist's work is best applied for comparatively short periods. Periods of rest are imperative. The physician may properly urge prophylactic measures when any of his patients are under treatment, so that the child's digestion may not suffer and that his teeth may be as free as possible from harmful influence. It should be recognized also that only in rare instances do facial muscles, distorted through the influences of nasal obstructions, adenoids or enlarged tonsils, become normal without some conscious effort. Such children should be given a thorough and well-balanced system of exercises of the various groups of the facial muscles in order to restore them to normal and to cure the habit of mouth-breathing, acquired through the period of nasal obstruction.

520 Beacon Street.

EDEMA FROM UNDERNOURISHMENT IN YOUNG CHILDREN (Zeitschrift für Kinderheilkunde, Berlin, Sept. 5, 1921). Schick and Wagner describe two cases of digestive insufficiency impeding the growth and development in general in children of about 4. One child had intense edema and high fever, the other only slight edema, but the stools of both were profuse, shimmering with fat at times; at other times showing foamy fermentation. On a mixed diet, including carbohydrates and fat, improvement was soon pronounced and one child gained 13 kg. in three and a half months and the stools became normal. The appetite of both had been capricious for nearly two years and they often refused ordinary food. One, at times, ate only the whites of hard boiled eggs. At every unwatched moment, she scratched plaster from the wall and swallowed it. The cases seem to belong in the class with edema from undernourishment in adults, a kind of avitaminosis. For all such cases, instead of a diet to spare the digestive apparatus, food to exercise and train it is preferable.—*Journal A. M. A.*

WHOOPING-COUGH AND ITS TREATMENT.*

By Hermann N. Appel, M.D., and Otto I. Bloom, M.D.,

New York.

Before discussing the value of any particular method of therapeusis in a disease so varied in its manifestations, and whose symptoms and course differ to so great an extent in each individual case as they do in whooping-cough, it may be of value to recall briefly the main features of the disease and show the value of our therapeutic agent in each of these factors.

Pertussis, or whooping-cough, known also by other names, does not appear in the writings of the ancient Greeks or Romans. The first historical citation of the disease appears in a history of France, published in 1414. The first epidemic recorded was that in Paris in 1578, and then described as a "nervous irritation of the lungs." Within the next century, the disease had manifested itself in all latitudes and about the year 1675, an epidemic was reported among children in Oxford, England, described then as "chin-cough." The earliest original poem of John Milton in his own tongue, which has been preserved, was written on the death of a young child, the daughter of his sister, from pertussis. It bears the simple and affecting title, "On the Death of a Fair Infant, Dying of a Cough" whom he thus apostrophizes in the first lines:—

> "O fairest flower, no sooner blown but blasted,
> Soft silken primrose, fading timelessly."

Milton also speaks of the affliction in the eleventh book of his "Paradise Lost" referring to it as "fierce catarrh" when the angel Michael points out to Adam the various miseries "the inabstinence of Eve shall bring on men." The mortality of the disease gradually increased, and because of the little progress made by the regular practitioners of the times, it gradually fell into the hands of quacks and old women. Until the nineteenth century no advance was made in the treatment of this severe disease. The introduction of cow-pox virus and the progress of bacteriology led to the use of biologic products in place of other treatments in such diseases as diphtheria, typhoid and pneumonia.

---

* Read before the Eastern Medical Society, May 13, 1921.

Bordet and Gengou began their work of investigation of whooping-cough in 1896 and 10 years later (1906) announced the discovery of the bacillus pertussis. Two years later, Klimenko showed that the organism carries out the 4 points of specificity of Koch, and from then commences the history of the biologic therapy of whooping-cough. And certainly any treatment of promise in a disease so fatal to infants merits earnest consideration and thorough trial. All the more so, when we consider the fact that in the city of New York, where the population is constantly increasing, diseases like diphtheria, measles and scarlet fever are on the decrease while whooping-cough is on the increase, both in incidence and in mortality. The New York City Health Department reports for 1920 show that the mortality of whooping-cough is second only to diphtheria among the contagious diseases, and that it is the most fatal of all to infants under one year of age. Contrary to popular opinion, it is a most serious disease and Griffith cites figures showing that in the United States alone, in the past 10 years, 100,000 children died of the disease, while in England and Wales the deaths were 65,000 in 8 years. If to these figures we were to add the additional deaths assigned to complications and sequelae, the total would be considerably increased. All of which is a poor showing for the value of the therapeutic measures used hitherto.

Etiology. The organism is the bacillus pertussis. It may be seen in smear preparations, is easily stained by carbol-fuchsin and appears as minute oval rods. The organism is most virulent in the catarrhal stage, especially to children affected with or recovering from an attack of measles, and is but short-lived, not existing for any length of time outside of the body. It is transmitted by direct carriers (droplets, sputum) and is avirulent in the third stage of the disease. It affects principally children under 5. The incubation period is 4 to 21 days.

Pathology. In uncomplicated cases the pathology is that of a diffuse catarrhal inflammation of the respiratory tract, with predominating nervous symptoms; so much so, that Czerny maintains that only the catarrh is transmitted, the whoop being a "psychic infection." Dobelli goes still further and maintains that a child must have heard a whoop before it has a whoop. Explaining the paroxysms of coughing, Mallory believes that the bronchial cilia become matted together, mucus gradually accumulates and this results in a fit of coughing when an attempt is made to expel it. The blood presents an interesting picture. In the catarrhal stage, a considerable leucocytosis is present. In a series of 24 cases, the average was 20,000; the lowest count being 7,600, the highest, 85,000. Another important point is the absolute and relative increase of the percentage of polymorphonuclears and lymphocytes, the latter being 75 per cent. or more of all white cells. Crombie reports a case with a leucocyte count of 141,000; Cabot, one of 185,000 and in a fatal case with convulsions the count was 223,000. In the second and third stages and when complications arise, as bronchopneumonia, a leucopenia may be present. The value of these observations is that they are of great help in detecting early cases in asylums and in private practice. Merely a blood smear and we have an important aid in the diagnosis.

Symptoms. (1) Catarrhal stage; in the beginning the symptoms are those of respiratory catarrh; a persistent bronchial cough, worse at night, unrelieved by ordinary medication and presenting but few physical signs. There is little or no temperature, slight coryza and conjunctivitis. This lasts from a week to two and is followed by

(2) The paroxysmal stage which is characterized by the whoop. Regarding the neurotic or psychic elements that enter into the production of the whoop, much has been written and the opportunity has undoubtedly presented itself to every practitioner at some time or other in the course of the disease to find that the whoop is in some instances under control of the will. In clinics it is often observed that children will suppress their cough and when the students have left, will all commence to whoop; threatening with punishment may cause inhibition although not very often. A case is on record where an acute appendix complicated an attack of whooping-cough, and after operation, the pain was so severe on coughing that the paroxysms were stopped entirely. In our own institution, we rewarded with candy those who whooped least but without avail; the youngster no sooner would receive the candy for perhaps successfully suppressing a cough than off he would go in a corner, commence to whoop and vomit up the reward he had received. In connec-

tion with the paroxysm, an aura is frequently present. It is in this stage that the disease manifests its vicious tendencies. Disturbed rest, loss of weight due to the vomiting, and the exertion and liability to complications characterize this period of disease, which is especially poorly borne by rachitic or ill-nourished children.

(3) Stage of decline; this is not sharply differentiated from the preceding one; the cough still persists but the spasms are milder and further apart, the decline being a gradual one. In this stage, bronchial evidences such as râles and mucopurulent expectoration become manifest. This stage is apt to be prolonged for months, especially in the winter when new "colds" are superimposed. In general, it may be said that when there has been no whoop for a week or so the child is recovered. The average duration of the illness is from 6 weeks to 3 months.

Complications. These are more severe than the disease. Hemorrhages are common and often alarming, especially hemoptysis when vomiting is frequent. Bleeding into the eyelids (black-eye) has been reported but is rare. In connection with hemorrhages, the question of their causation is a mooted one. They may be mechanical, and there is enough evidence to explain them in this manner, or they may be toxic, as in a case where with the early use of vaccines, the whoop and paroxysms were entirely aborted but conjunctival hemorrhage was present. The bleeding may also assume purpuric, cerebral and meningeal aspects. The digestive disorder principally encountered is vomiting. Convulsions, or, in the young children, a profound stupor may be present. Aphasia has been noted. Respiratory complications are frequent—laryngitis, bronchitis and bronchopneumonia—the latter characterized by an easing in the whoop but an increase in the frequency of the cough. Lobar pneumonia is rare; emphysema, pneumothorax and rupture of the lung have been met with.

Sequelae. Among the cardiac sequelae are cardiac dilatation and valvular disease. In a series of 200 cases, Anders found the kidneys affected in 20 per cent.; an acute nephritis which frequently occurs is as severe as that in scarlet fever. Otorrhea is common. All the viscera are liable to fatty degeneration. The resistance to tuberculosis is decidedly lowered after an attack of whooping-cough. In an observation covering a great number of tuberculosis cases, an unusually large percentage gave histories of whooping-cough. There is also a great tendency to rickets, and, as a result of the paroxysm and the mechanical effects upon the soft bones, also to permanent deformities of the chest. It is our opinion that a considerable number of asthmas in childhood can be dated back to the resulting emphysema from an attack of whooping-cough.

Diagnosis. The diagnosis in the paroxysmal stage is easy. It is in the catarrhal stage when the diagnosis is important and more difficult. The points of particular significance are a cough that does not respond to ordinary treatment, is more severe at night, and presents very few physical signs. E. Smith speaks of the contrast between the few signs and the large number of symptoms. The presence of an epidemic is of significance. A great diagnostic aid is in the examination of a blood smear which should be resorted to in all doubtful cases. For the busy practitioner, a smear with findings as enumerated above will confirm the diagnosis. A new method for diagnosing the presence of or susceptibility to the disease following very recent exposure to an active whooping-cough case has recently been brought forward by Modigliani and Villa working in Rome. This consists in the intradermal injection of the Bordet-Gengou bacilli prepared by a special method which gives a characteristic and specific reaction of the skin. We are, at present, trying out this test in a series of cases and the results already are promising and may equal the Schick test in its efficiency.

Prognosis. The prognosis in every case of whooping-cough is serious. The disease is severe: the complications kill and the sequelae cripple.

Treatment. In the treatment for this affliction, therapeutists have run the gamut of the entire materia medica without finding any agent or group of agents that has proven of any avail in the cure of the disease or in its prevention. When we consider that for prophylaxis, drugs are worthless and that the best method at our command, namely, isolation, is hardly feasible in a disease lasting an average of 2 or 3 months, where fresh air is a constant necessity and with the parents not believing the child to be really sick, it becomes evident why preventive medicine has accomplished so little in this disease. In vaccines, however, we have a valuable aid and most investigators now believe that prophylaxis by vaccines is good, if allowance is made for those cases in which the disease is probably incubative at the time of the injections. Comparing the results obtained by prophylactic vaccination, as shown below, with similar results familiar to all, which have followed the usual methods of isolation, hygiene, etc., the balance is distinctly in favor of the former, and almost so conclusively so, as to leave no doubt as to the great value of prophylactic vaccination.

Medical treatment is entirely unsatisfactory; the most we can hope to do is to lessen the severity of the paroxysms by antispasmodics. Expectorants, germicides, nerve-sedatives and recently, coal-tar products have been used because it was felt that something had to be done, rather than with the idea that they would be of any particular benefit. The usual hygienic measures should be carried out throughout the course of disease, and outdoor life should be encouraged. A sojourn at the seashore is often of value. Care should be taken to prevent unnecessary exposure and chilling, and that adequate clothing is worn. Concentrated food should be fed after vomiting. The local methods of treatment that have been used are numberless. Direct applications to the larynx of solutions of resorcin, cocain, chlorate of potash, peroxide, salicylic acid, and more recently, 10 per cent. antipyrin, as recommended by Grushlaw, have been tried. Quinine, boric acid, tannic acid, iodoform and salicylic acid, singly or in combination, are lauded as means of direct insufflation. In an institution in charge of Dr. Kerley, in test cases insufflation was found impractical and useless. Inhalations are often resorted to, but outside of a popular appeal they have no value. In crowded cities, the atmosphere in the neighborhood of gas-tanks is commonly supposed to have a beneficial influence, but whatever value it has, is probably due to the fact that it brings the patients out in the open and away from the vitiated air of the tenements. In complicating bronchitis or bronchopneumonia, inhalations may be useful. A list of drugs that have been used in whooping-cough could serve as an index for a text-book on therapeutics. Most of these are valueless; others have some slight benefit. Belladonna, bromides, bromoform, antipyrin, quinine and the derivatives of opium are the principal drugs used. Cocain, chloral, alum, dilute nitric acid and the terpin derivatives are claimed to have good effect. Pertussin and diatussin are used, and in some cases, with benefit. Injections of ether have been tried recently, but because of its slight, if any, value and the pain attached to its administration, the remedy is perhaps worse than the disease. The disadvantages of nearly all drugs used in this disease are the large doses needed, the difficulty of administration, the upsetting of digestion, the danger of an overdose and a development of tolerance. Of all drugs, a combination of bromides, antipyrin, codein, Tr. belladonna and terpin-hydrate seems to give the best results. Benzyl-benzoate in solutions has recently been advocated but has proved disappointing. These remedies should not be used until the height of the paroxysmal stage, because if started early, the child develops a tolerance for them and so when most needed they are non-effective. The Kilmer belt has advantages in severe cases of vomiting. If a paroxysm is accompanied by deep cyanosis, Von Naegli recommends the procedure of pulling the lower jaw downward and forward and as soon as mouth is opened, both index fingers being inserted in the region of the eye-teeth and the jaw held firmly. In moderate paroxysms, it is often sufficient to pull the tongue forward and blow forcibly into the mouth. To overcome spasm of the glottis and to prevent asphyxia when the paroxysms are frequent and severe, O'Dwyer and Northup performed intubation.

Not until the discovery of the infecting organism could a specific treatment be available, and hence, it was that with the finding of the Bordet-Gengou bacillus, attempts to provide such a remedy were made. Sera have proven a failure, and in vaccine-therapy lies the promise of success in the future. It would be wearisome, perhaps, to recite the stormy path that this method of treatment has had from its inception to this day; a path ranging from the heights of specificity to the depths of actual harm. But it is curious to note that while most earlier writers either condemn it outright or place a doubtful value on its usefulness, the tone has gradually changed to one favoring it and to-day a greater number are of the opinion that, correctly used and sufficiently early and in proper dosage, it has an inestimable value in prophylaxis, while in its curative effect it has definitely reduced the duration of the disease, lessened the number of paroxysms, stopped the loss of weight, prevented complications and reduced the mortality. It might be of interest to review briefly the findings of those who have done most work with the vaccine.

1909. Zahorsky reports favorable results.
Lehman reports favorable results.
1911. Graham reports 24 cases in which 71 per cent. were benefited.
1912. Bacher reports 24 cases with unfavorable results.
Saunders reports 24 cases with favorable results.
Saunders reports 14 cases successfully immunized.
Ladd reports 9 favorable cases.
Scott reports 30 favorable cases.
Davidson reports favorable cases.
1913. Scott reports 17 very favorable cases.
Wilson reports 24 cases in an institution of 500 children which were successfully treated. The other children were immunized successfully with the vaccines; 60 per cent. of the children were constitutional defectives.
Luttinger reports 10 cases favorably treated.
Sill reports 46 cases favorably treated, calling it the best treatment.
Zamberger reports 6 cases favorably treated.
Zamberger reports 3 cases favorably immunized.
1914. Kelsalls reports 30 cases favorably treated.
Kerley (Practice of Pediatrics) reports 1140 cases slightly favorably treated.
Hartshorn reports 18 cases not favorable.
Hoag reports 17 cases immunized successfully.
Hess reports 244 cases immunized with 92 per cent. escaping disease.
Hess reports 80 cases non-immunized with only 25 per cent. escaping disease.
Hess reports 65 cases, treated with no improvement.
1915. Luttinger reports 138 cases treated with favorable results.
Luttinger reports 9 prophylactics, all successful.

1916. Goler reports 10,000 cases vaccinated in an epidemic in Rochester and 95 per cent. escaped the disease.

Von Scholly reports no improvement.

Bloom reports 73 cases favorably cured—(a) duration shortened; (b) no weight loss; (c) no deaths; these cases seen at end of catarrhal stage. Reports also 16 cases successfully immunized.

1917. Luttinger reports 2364 dispensary cases with 87 per cent. good results and 13 per cent. negative.

Luttinger reports 1314 institutional cases where drugs had always been used giving 37 per cent. excellent results, 53 per cent. good and 10 per cent. negative.

Luttinger reports 368 prophylactic cases, in 277 of which showing symptoms, 53 per cent. were successfully immunized and in 91, without symptoms, 94 per cent. were successfully immunized.

Nicolle and Connor report 104 cases in Tunis, 35 per cent. cured and 38 per cent. improved.

1918. Shaw reports 112 cases with 88 per cent. favorable results.

Bogart reports during 1917 an epidemic in Rochester. In an institution of 46 children, 32 never had whooping-cough. One of these developed it and because of delayed diagnosis mixed with the others. He was successfully treated with vaccine and the other 31 were successfully immunized.

Huenekens, unfavorable in 1912, speaks favorably now.

Barenberg, 41 children given prophylaxis before exposure—93 per cent. escaped.

Barenberg, 220 children given prophylaxis during and after exposure—59 per cent. escaped, and those who were ill were but mildly so. In 18 unvaccinated—50 per cent. developed the disease; 28 treated curatively but with no effect.

1919. Reynolds (Yale Dispensary) reports 51 cases treated favorably.

Luttinger reports 187 cases treated with average duration of paroxysm 16 days.

Luttinger reports also 51 prophylactics with only 2 cases developing the disease.

Shaw reports 112 cases treated, with 88 per cent. favorably affected.

Shaw reports 164 exposed cases vaccinated with onty 7 per cent. getting the disease, the figures of unvaccinated being 50 per cent.

Rogers reports 11 cases favorably treated.

Rogers reports 6 cases protected with vaccine.

Sill (in Forscheimer Therapeutics) reported 61 cases favorably treated.

Sill also reports 20 cases successfully protected with vaccines.

1920. Clemenge and Fleming, quoting Freeman, report "a large series of observations at St. Mary's Hospital which showed" that the administration of a mixed vaccine of Bordet bacillus and pneumococcus cut short an attack. A much better response is obtained in some epidemics than in others, pointing to the possibility of a difference in the strain of the epidemic organism.

1920. The following is the history of an epidemic of whooping-cough occurring at the Israel Orphan Asylum, New York, an institution for children between 1 and 6 years of age. At the time of the outbreak there were 78 inmates lodged in 3 dormitories. The outbreak was in the summer and there were an especially large number of cases at that time in the city. It is not known how the infection crept into the institution. Between June 24, when the disease was recognized, and July 1, there developed in a ward housing 31 children, 14 cases of whooping-cough. These cases from the first were very severe, the paroxysms were frequent and unusually prolonged; to such an extent in fact that we deemed several visits of the attending physician a day insufficient and placed a physician in constant attendance both during the day and night. These children were immediately placed on vaccine treatment. The vaccine used was a mixed sensitized pertussis bacterin containing to each cubic centimeter:

Bacillus pertussis		1,000,000,000
Micrococcus catarrhalis		200,000,000
Staphylococcus aureus		200,000,000
Staphylococcus albus		200,000,000
Streptococcus		200,000,000
Bacillus influenzae		400,000,000
Pneumococcus	Type 1	50,000,000
"	Type 2	50,000,000
"	Type 3	50,000,000
"	Type 4	50,000,000

The doses were ½—1—1½ and 2 c.c. given intramuscularly every other day. There was no reaction following the first, second and third doses and only a mild febrile reaction after the last injection. A single dose of heroin, terpin-hydrate and antipyrin was given at night but not during the day. (In private practice we have repeatedly used a chemically-killed mixed pertussis vaccine in double the stated dosage, giving a course of treatment consisting of 6 injections without any ill effects but with decidedly beneficial results.) Within a few days after the last injection, a marked improvement was apparent and within 2 weeks, 12 of the cases were cured (no paroxysms or vomiting, and only a slight cough at night, not sufficient even to wake the child) and the remaining 2 cases were very much improved to the extent of having only 1 or 2 paroxysms in 24 hours and these quite mild. The other 17 children in that dormitory received for propyhlaxis the same vaccine in doses of 2, 4, 8 and 16 minims given intramuscularly every other day. Not a single case developed.

The remainder of the children (47) in the other dormitories, not having been in contact with those in the affected ward, left the city on July 2, as usual every summer, for the seashore. There were, at that time, a large number of whooping-cough cases at that resort. Unfortunately, isolation of these children was not properly carried out and there was contact between them and the visitors to the institution. About August 9, or 5 weeks after they had left the city, a number of the children commenced to cough. Because of the prevalence of the disease, it was decided to immunize all the children (47) and these received the same vaccine and prophylactic dosage as given above. By August

13, before the series of injections was completed, 9 cases had developed the disease and by the 27th, 18 additional cases.

Judging from our first series of cases, where vaccines had protected all exposed in one ward, it seems that the vaccine in the second group of cases was given too late, and, that, in the cases which subsequently developed it, the disease had been incubating at the time of its administration. Collecting our figures we have, therefore, a series of 64 cases exposed to whooping-cough in which prophylaxis with vaccines was used and resulting in 35 cases not contracting the disease (the number is really 37, but 2 cases may have had whooping-cough prior to admission) or about 55 per cent. of successful prophylaxis. Comparing this percentage with the percentage of natural immunities, 26 per cent., as given by a very careful investigator, Hess, in an institution similar to ours, we feel that the more than doubling of the natural immunity is due solely to the use of the vaccine as a prophylactic. Furthermore, we believe that had we used the prophylaxis in the second group of cases earlier than we did, rather than when some children had already started to cough, the results would have been much more favorable.

In reference to treatment, the 14 cases in the first group and the first 9 cases to develop in the second group were treated with vaccine; the other 18 by the usual drugs. Comparing the 23 vaccine-treated cases with the 18 medically-treated, the superiority of the former was very marked—to such an extent that even the nurses commented on the difference. The duration of the disease was shorter, the vomiting less frequent, the paroxysms milder and fewer in number. There were no complications and no deaths.

Since this has been written, there has been another admission of 17 children to this institution. Within a week, one of the children, who had previously coughed slightly, commenced to whoop and cultural examination of the sputum by the Department of Health was positive for Bordet-Gengou bacillus. The remaining 16 children were immediately given prophylactic treatment and at this writing (5 months later) only one child developed the disease and that in a very mild form. None of the children had pertussis prior to admission.

CONCLUSIONS.

In a disease so dreadful as whooping-cough and so fatal in its immediate, and so disastrous in its late consequences, whose etiology and epidemiology are known, and yet whose mortality is constantly on the increase and against which all methods have proven of so little use, any new means of combating it is worthy of all serious consideration, especially when such means is logical and founded on etiologic grounds. We say logical because we believe that the giving of vaccines in an acute febrile disease, such as pneumonia or erysipelas is not to be encouraged, since it is but adding insult to a system already overburdened by a similar poison and which has not had a chance to accommodate itself to the new condition. In a low-grade toxemia, however, such as whooping-cough, the injection of the vaccines will throw the balance in favor of the body as is clearly demonstrated by the fact that after the third and fourth injections, there is an aggravation of the clinical picture; which at the same time gives an impetus to the further production of antibodies and from then on, the body is able to take care of itself and improvement is noted. Such a means we have in whooping-cough vaccine. In those cases where it has failed to give satisfaction, it is probable that the strain of organism used in the vaccine was different from that producing the disease, or that a mixed vaccine was not used since secondary invaders are always present with the pertussis bacillus, or that an inert vaccine was used or the dosage not sufficiently large. In the closing paragraph of the Weekly Bulletin of the New York City Health Department for November 6, 1920, the Department urges the prophylactic inoculation of children in institutions and states that it may mean the saving of many lives and that the reaction to the vaccine is negligible; while health authorities of other cities advocate the use of mixed vaccine both for prophylaxis and especially for treatment. The average duration of the disease, as given by authorities, is from 45 to 100 days—with vaccines, the duration has been cut down to about 30 days, the severity has been mitigated, complications prevented and mortality reduced. Should its prophylaxis and cures be far from 100 per cent., any remedy that accomplishes all the above is a better remedy than any that has hitherto been put forward and should be used. Pertussis vaccine has done all this and has, therefore, established itself as a definite scientific entity of almost, if not actual, specific value in the treatment of whooping-cough.

We wish to express our thanks to Dr. S. Blauner, Medical Director of the Israel Orphan Asylum and Dr. Joseph Popper, on whose service most of the work was done.

BIBLIOGRAPHY.

VanderBogart, F.: Experience with Vaccine in Prevention of Whooping-cough. Am. J. Dis. Child., 15:271, Apr., 1918.

Bloom, C. J.: Vaccine Therapy: the Most Rational and Effective Method of Treatment of Whooping-cough. ARCH. PEDIAT., 36:1, Jan., 1919.

Luttinger, P.: Vaccine Therapy as Routine Treatment in Whooping-cough. New York M. J., 109:322, Feb. 22, 1919.

Huenekens, E. J.: Prophylactic Use of Vaccines Controlled by Complement-fixation Test. Am. J. Dis. Child., 14:283, Oct., 1917.

Luttinger, P.: Value of Pertussis Vaccine as Curative and Prophylactic Agent. J.A.M.A., 68:1461, May 19, 1917.

Reynolds, H. S.: Vaccine Therapy in 51 Cases of Pertussis. ARCH. PEDIAT., 36:290, May, 1919.

Barenberg, L. H.: Curative and Prophylactic Value of Vaccines in Whooping-cough. Am. J. Dis. Child., 16:23, July, 1918.

Talbot, F. B.: Med. Clinics of N. America, 3:1127, Jan., 1920.

Hess, Alfred F.: The Use of a Series of Vaccines in the Prophylaxis and Treatment of an Epidemic of Pertussis. J.A.M.A., 63:1007, Sept. 19, 1914.

MELENA IN THE NEW-BORN (Zeitschrift für Kinderheilkunde, Berlin, Sept. 5, 1921) Müller reviews the various theories advanced to explain melena in the new-born, his conclusion being that various causes may be responsible for it in different cases. In one of 5 fatal cases described the hemorrhage came from an ulcer in the lower esophagus, as also in 4 he quotes from the literature. This child had been born asphyxiated, and artificial respiration by compression of the thorax had been kept up a long time. A mechanical injury seemed probable as there were no signs of inflammation, syphilis or hemophilia. In a second case the hemorrhage came from the middle ear, and the blood poured from the mouth. The child died before the bowels moved. In 3 other cases the blood came from the nasal mucosa as in Swoboda's 4 cases. Bleeding from the nose in an infant may proceed insidiously and escape notice as the child lies on its back and swallows the blood. Aspiration of the blood into the air passages was the direct cause of death in 2 of his cases. Diphtheria was responsible in 2 plus, in one case, fatal meningitis and bronchopneumonia.—*Journal A. M. A.*

THE LATE TREATMENT OF CHOREA AS A PROBLEM OF CONVALESCENCE.*

By George R. Irving, M.D.,
Consulting Pediatrist, Burke Foundation, White Plains, N. Y.
New York

In reviewing the records of the younger patients treated for chorea at Burke Foundation, we are struck with the very remarkable progress made under conditions of active, out-of-door management—rest, play, and work. The admissions for this condition, both to the boys' branch, Sunny Brae, and to the main institution, covering the period of 1915 to 1920 inclusive, form the basis for this study, which sets forth the results obtained in 123 successive children with this disease. This report is presented only as an experience tending to show the value and place of supervised country convalescence in chorea.

In treating a subject concerning which there is still considerable controversy, it was thought best to review the literature for something of a standard. Nearly all authors agree that chorea is a functional disease of the nervous system, and that the chief characteristic, and the one upon which the clinical diagnosis rests, is the presence of irregular, aimless, or purposeless, involuntary movements or twitchings affecting any or all of the voluntary muscles. In addition, there may be a degree of mental irritability. Cardiac manifestations are reported as of frequent occurrence, in general being found more often with a recurrence of the disease.

As to the length of the ailment, the general average given is about 10 weeks, with the duration ranging from 4 to 12 weeks. The majority of authors draw special attention to the spontaneous recovery from chorea, this occurring (Holt) usually at from 6 to 10 weeks. All investigators look upon chorea as a disease very prone to relapse.

Recently there has been a decided tendency to stress the details of the treatment by means other than by medicine. Most authors agree that rest is one of the prime factors in the management, some insisting that this be carried out under conditions of absolute isolation, while others allow mild physical activities, with restricted

---

*Study made through the F. K. Sturgis Research Fund.

attendance in the matter of visitors. There is, however, increasing importance being attached to a type of restriction, brought about by country or seashore convalescence, avoiding only the more violent exercises, and at the same time instituting such general strengthening measures as might tend to lessen recurrence or minimize the danger due to existent or possible cardiac and rheumatic conditions. This has stimulated considerable discussion as to the advisability of a somewhat more active régime for the chorea patient, particularly in the convalescent stage, and thus has prompted our review of this institution's policy in the matter.

FIG. 1. Boys' field day, under rigid supervision. Contestants are often limited to entering one event; the winner of one prize may be barred from other competitions; events found to be productive of least physical strain, as single attempts at the light "shot," but stimulating much argument and discussion, are the ones selected.

Only the accepted, straight types of chorea (chorea of Sydenham or chorea minor) were admitted. Admission was made through the city office of the Foundation, based mainly upon the medical and social diagnosis of the physician, or agency referring. The only characteristics insisted upon at the time of making the admission were the "irregular, involuntary twitching of some of the muscles of the body," with a general condition considered suitable for entrance upon the régime, that is to say, they were able to walk fairly well, and to feed themselves at the table, although often with considerable difficulty.

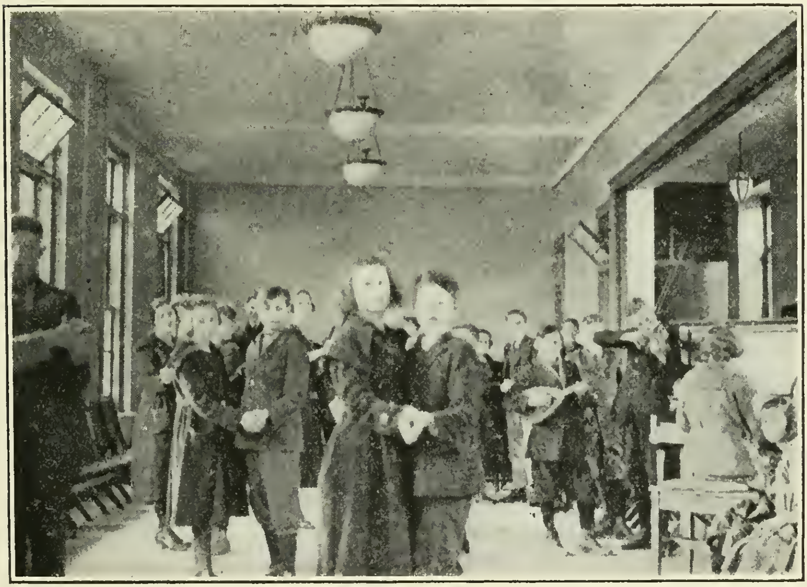


FIG. 2. The dancing class has been found to be a valuable activity for the convalescent child. This is carried out, in the open air, upon the spacious terraces,—weather permitting,—seven months of the year. The orchestra, composed of patients, is an especially interesting and stimulating feature, and an important factor in the recreation-therapy.

The age of the 123 patients ranged from 9 years to 16 years, as in the table below:

Age	9	10	11	12	13	14	15	16
M:	8	14	16	20	9	12	11	8
F:	0	1	0	6	4	7	5	2
	—	—	—	—	—	—	—	—
	8	15	16	26	13	19	16	10

Total: Boys 98, girls 25.

It will be seen that there are almost 4 times as many boys as girls, a reversal of the accepted sex incidence in chorea, due to the Foundation having made special provision for the much needed accommodation of the generally neglected boys at the Sunny Brae branch.

All but 4 of this series came from Greater New York, referred by hospitals and social agencies or by private physicians.

The following tabulation shows the seasonal incidence, as indicated by the admissions each month:

Fig. 3. Winter might bring a disadvantage in the restriction it imposes, were it not for the reversion to the hiking, skating, coasting, and snow-balling. These old-fashioned activities, under proper supervision, not only meet the physical requirement, but fill the convalescent child with courage to attempt things under conditions usually regarded as prohibitive. This group has just completed the walk to the gates in spite of the thermometer registering 2° below zero.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
M:	4	8	4	7	10	6	12	17	7	12	5	6
F:	4	1	2	0	2	0	3	2	1	7	3	0
Total by mo.:	8	9	6	7	12	6	15	19	8	19	8	6

As there were no restrictions on the proportion of chorea to other diseases admitted, this may in some small measure bear upon the year-round prevalence.

Among this group of 123 patients with chorea, the following complications and intercurrent conditions were found:

Cardiac complications (all types and varying grades).	49 or 39.8% of total admissions.
Low mentality	3
Encephalitis lethargica	2
Post-operative: tonsils	4
Post-operative: hernia	1
Defective teeth	13
Enuresis	1
Blindness of one eye	1
Nasal obstruction	1
Rheumatism	2
Localized infection (abscesses and boils)	2
Sore throat or enlarged tonsils during residence	5
Traumatic complaint on admission	2
Chicken pox	1

FIG. 4. In theory, gardening is an ideal occupation for the patient convalescing from acute illness; practically, he does not often remain long enough to see the result of his efforts. Then, too, the soiling incident to this form of activity militates against its popularity. The gardens supply a field for limited part-time employment for those with increasing strength but still in need of observation.

Among these figures it will be found that there is a somewhat high occurrence of cardiac manifestations. This may be due to the relatively large number of patients in this group who have had recurrence of the disease, as there is a definite history among 28 (22.7 per cent.) of these patients in which 2 or more definite attacks have occurred. The degree of accuracy as to the history of recurrence might well be regarded with suspicion, due to the human tendency to minimize the story of the trouble and the severity, and its possible complications.

The relatively low occurrence of rheumatism may be explained by the high degree of care given these patients before admission to the Foundation,—the early and acute-stage treatment,—and the efforts made to eliminate possible foci of infection.

The following tabulation gives the record of the number of attacks as taken from the admission history:

1	98
2	16
3	3
4	2
Multiple attacks (more than 4)	7
Hemi-attacks	3

Of this group, and throughout the period over which our observations run, there have been 5 re-admissions, all among boys, but this does not attempt to determine the number of recurrences, as these were not consistently followed up.

Fig. 5. It has been found that a large amount of costly equipment is not absolutely essential to the usefulness of a plant for convalescent children. These chorea patients, some athletic equipment, and the pets of the average small farm, all under proper supervision, made an ideal combination.

The length of stay in the institution ranged from 8 days to 162 days,—this exceptionally long stay having been a particularly worthy patient who remained under conditions of part-time employment. The average residence was 33.8 days. The stay varied with the condition on admission, a satisfactory improvement at the end of a given period of time, the ability to resume school, and the anticipated coöperation of patient, parent, and the referring agency in the matter of follow-up.

The admission routine was accomplished through the city office, these patients being admitted in company with 20 to 30 other patients, with often as many diversified conditions. No complete physical examination by a physician was undertaken, diagnosis being accepted from a referring agency, and all observations and records were made by a specially trained nurse. It was arranged that the time consumed in filling out the patient's record was never greater than 15 minutes.

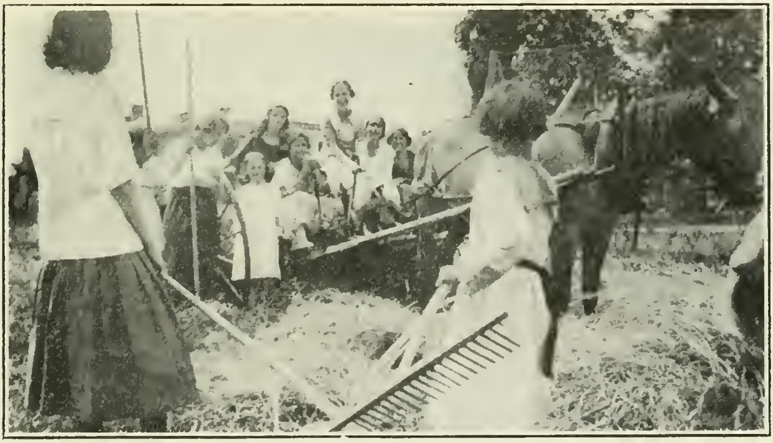


FIG. 6. Hay raking at Burke Foundation is always "reserved" for patients. Close observation of convalescents permits the use of this strenuous activity over short periods.

Before the trip to the hospital, provision was made for rest and lunch. Transportation was accomplished over the 25-mile route in a 30-passenger motor bus equipped with pneumatic tires, and a special shock absorbing apparatus, so as to give the highest degree of comfort on the journey.

On arriving, preliminary examination was made by the resident physician to detect the unusually fatigued, or those otherwise needing special attention. Assignment to quarters was made, with emphasis upon the relation to stairs, the need for supervision and association with other patients.

Group talks by the resident physician or the head nurse urged the fullest degree of coöperation throughout the stay. On the day following admission, a physical examination was undertaken sufficiently comprehensive to issue a written order for the occupational and recreational activity. Approximately once a week this examination was repeated, more often at first, and less frequently with favorable progress, until the final conference for discharge.

Almost no drugs were used, the incidental conditions being the ones usually requiring medication.

The diet arranged was one with low protein content, but well balanced, satisfying in amount and in the manner of service.

FIG. 7. Tether ball, tennis, and much "short golf," properly utilized, are of great value in the reconditioning of chorea children. The golf course is laid out over a series of easy slopes, the holes at 10 to 40 yards distance.

Further talks by the resident physician were given from time to time to explain the methods of the routine, and to urge the entering into the routine. The head nurse of the floor or cottage contributed largely through suggestions and mental therapy in the effort to stimulate fullest coöperation, and in planning to secure the most advantageous cottage arrangements, and the most congenial dining room assignments. Patients were always encouraged to enter into the games, given little tasks to offset homesickness and were encouraged to write cheerful letters home.

The daily routine is as follows:

6:30 Rise.
Bath if desired—not a daily requirement.
Urged to be out of doors, walk, sit in sun, quiet games.

7:30 Breakfast.
Assist in tidying room; make bed.
Read—papers, library; go to store; toys.
Games—indoors in cold or stormy weather: stories, dancing class, table tennis, billiards.
Urged to be out of doors: short base ball, quoits, tether ball, croquet, golf, dancing class, medicine ball, grade walks (supervised). Frequent rests.

10:00 Glass of milk.

FIG. 8. It took only a tactful boy leader with one of the groups of Sunny Brae boys to provide an ideal play place. Cement ware, reed and raffia weaving, and toy making rate with carpentry in providing occupational training.

10:10-11:30 Prescribed occupation: care of grounds, carpentry, gardening, cement ware, reed and raffia weaving.

11:30 Rest.

12:30 Dinner.

1-2 Rest hour—flat on bed, talking not permitted; longer period for newcomers.

2-5 Games, including participation in tournaments by the stronger, and occasionally part time employment of older boys and girls about grounds and buildings. Frequent rests.

5:00 Supper.

6-8:30 Dancing, letters, indoor games, reading.

9:00 Lights out.

Improvement has been judged upon a lessening or disappearance of the involuntary twitchings, lessened appearance of anemia, taking on an amount of weight to bring the patient up to his approximate normal for his years and build, and a general increase of tone, evidenced in the muscular activity and in the clear, interested facies of the patient. This latter observation is very difficult of statement on paper, but, in the main, consists of a better bodily posture, at rest and in activity, a firmer musculature, a clearer glow with an increasing hemic component of skin and mucous membranes, keener interest and participation in environment, and the absence of circles under the eyes, which appear brighter and are often seen to lose the bluish tinge to the sclera.

With the exception of 5, whose stay was short, all of this group of patients are recorded as showing a degree of improvement noted as "good." These 5 failures are classified as follows:

1 Chronic cough, needing further diagnosis.
1 Ran away.
1 Not coöperative.
1 Homesickness.
1 Progressively increasing choreiform manifestations.

As to weight:

	Gain		Loss		
	Boys	Girls	Boys	Girls	Total
Cardiac	37	9	5	0	51
Non-cardiac	54	15	2	1	72

115 children gained 489 pounds. 8 children lost 17¾ pounds.

Average Gain 3.86 pounds per child.

SUMMARY AND CONCLUSIONS

1. Supervised activity in the late treatment of chorea, in this series, did not lengthen the course of the attack, as compared with the standard figures on the duration of the ailment.

2. Little difference has been found in the progress of cardiac

and non-cardiac patients convalescing from chorea, the weight gains slightly favoring the non-cardiac.

3. Chorea patients are not hindered in their convalescence by the presence of other patients or by the nursing methods—a point of great importance in mental therapy.

4. This more active method in caring for the chorea patient is in line with the latest advanced ideas of convalescence in other diseases.

5. By better "conditioning" in the open air during this stage of chorea, the patient is found to be stronger in every way at the termination of the attack; physically and bodily improved, morally encouraged as to his outcome and the effect of this disease upon his ultimate well being; mentally given an interest in out-of-doors and in play as a valuable means of upbuilding.

26 East 64th Street.

CONCENTRATED FOOD FOR INFANTS (Zeitschrift für Kinderheilkunde, Berlin, Sept. 5, 1921). Helmreich and Schick have doubled the nourishing power of milk by adding 17 per cent. of cane sugar to human or cow's milk. By adding only 8.5 per cent. the nourishing value was increased one and a half times. They report experiences in this line in the Vienna Children's Clinic in charge of Pirquet. In all, 3888 tests were made on 185 infants, and the results repeatedly compared with the index of nourishment over long periods by various methods. Special indications for the more concentrated food include nervous vomiting, pylorospasm, difficulty in swallowing or breathing, whooping cough, anorexia, bed wetting, etc. Their research confirms the importance in certain conditions of giving food in a more concentrated form at all ages; especially for the new-born, this "whole milk-sugar double food" has a number of advantages, not the least among them being the comparative scantiness of the urine. The child does not wet so much as usual, sparing both its skin and the number of diapers. They warn that this double concentrated food—dubo, they call it—is not for the normal and not for general adoption by the public, but they regard it as extremely useful in certain conditions as they show by numerous concrete examples. —*Journal A. M. A.*

WHAT A HEALTH CENTRE MAY MEAN TO A COMMUNITY*

By J. H. MASON KNOX, JR., M.D.

Baltimore.

It is a truism now-a-days to assert that the real prosperity of a country depends in large part upon the health, intelligence and contentment of the average citizen. The loss to the world in the past through the early death and disease of useful men and women is incalculable, yet greater still is the loss which has resulted from the failure to live of unborn and newly born potential workers and thinkers. Think too of the large hordes of men and women of the past ages and even of our own day who have lived and are living in wretchedness and fear from ill health.

The peoples of America and of England were startled at the disclosures of the records of the young men examined for participation in the world war. In this country, of the 2,500,000 men examined, out of every thousand there were 468 found to be defective and 30 per cent. were physically unfit for any military service at all. It was shown too that fully half of these defects could have been prevented or corrected had they been attended to in childhood and had each individual been trained in proper habits of personal hygiene. When we consier that these 2,500,000 men were selected from the most vigorous period in life. we can form some conception of the larger proportion of our population, older in years, in whom the multitudinous physical disabilities due to disease and age are added to the defects shown to be present in youth. Surely no demonstration could be more complete of the need of the American people for education in matters of public health; no subject should so challenge the attention of every physician and every agency concerned with the physical well-being of the people.

We are a life wasting nation. During the year 1917 approximately 1,500,000 persons died in the United States and it is believed with good reason that 42 per cent. or 630,000 of these deaths could have been prevented. What is needed therefore is by every means to bring home to each man and woman in the country that a high degree of physical and mental health is an irreducible requirement for a people's prosperity. It has been repeatedly observed that health is a purchasable commodity—any community can overcome its unnecessary loss in disease and death, which is ready to pay the price in service and money. The reason that the price is not offered is because the average man or woman does not appreciate the situation. Half a million deaths occur from degenerative diseases and cancer. These may not be prevented but can be postponed, giving to the individual the benefit of years of efficient living. Practically more than 1 out of every 10 babies die during the first year. This death rate could easily be cut in half. Twenty-five thousand women die annually in childbirth—a higher rate than occurs in any other large civilized country. This tragic recital of mortality records is only a part of the picture, which omits any mention of the hundreds of thousands who suffer from painful and incapacitating illnesses.

---

* Read before the Thirty-third Annual Meeting of the American Pediatric Society, held at Swampscott, Mass., June 2, 3 and 4, 1921.

The average financial loss in this country due to illness is said to be $500,000,000 annually. Of the whole population of the United States, it has been estimated that there are:

Physically defective	45,000,000
Fairly healthy	37,500,000
Full vigor	19,500,000
In bed all the time	3,000,000
Tuberculosis	1,000,000
Contract venereal disease each year	2,500,000
Hookworm and malaria	2,500,000

Our army and navy lost less than 50,000 men through combat in the world war. In the same period there occurred in the country 20 times that number, or 1,000,000 deaths from causes that were preventible or postponable. Is it possible that the same co-operative efficiency between the government and the caricatured "common people" which provided the tender care of our sick and wounded young men in the army should not be extended to the much larger number of our people ill and dying in civil life?

Is it not the time to take a somewhat broader view of health administration? Radical measures can alone hope to cope with such deplorable conditions. Most of the so-called health legislation from the earliest times to the present day has been directed at the correction of well-known sanitary imperfections rather than concerned with the *direct prevention* of disease and premature death. Practically all that has to do with the health of the individual and his or her physical well-being is still considered a matter of personal concern only. Many believe that a national health administration in the future will be devoted primarily to the task of supervising the growth and development of the nation's childhood, continued through the period of early and late adolescence, inclusive of the entrance into industry or other pursuits and activities.

In 1904 a report was made to the British government on the subject of the physical deterioration of the people. Among the principal recommendations were these, that there should be made an anthropometric survey including the periodic examination and measurement of children and young persons in schools and factories and also that there should be a registry of sickness not confined to infectious diseases. If these recommendations had been seriously acted upon who can doubt that the revelations of the war examinations in England would have been materially modified.

Professor Keith of the Royal Institute of Public Health declared in 1918 that "if the health of the people had been looked after that we should have been able to put into the fighting ranks at least a million more men."

The effect of environment upon growing children has been repeatedly demonstrated; the probability of healthy development is often permanently shattered before children begin to attend school by unhygienic home surroundings. In an investigation in Glasgow it was found that of all the children from 3 to 18 years of age the average weight of the one room boy was 52 pounds, of the 2 room boy, 60 pounds, and of the 4 room boy, 64 pounds, and that the heights of the boys in these respective groups were 46, 48, 50, and 51 inches. Any thorough investigation of school children at present discovers physical defects interfering with their normal progress, which have escaped detection until too late to be easily remedied. In other words, in the future a greater emphasis must be placed upon physical rather than medical facts and a more concerted effort made to ascertain and prevent defects in physical growth and development.

It will be hardly possible at an early date to bring the population of a nation or even a state into a satisfactory physical condition. It may be practicable however, in a *smaller area* to greatly improve the average health and to make the demonstration of the good results so striking that other communities will demand similar benefits.

This is the idea of the so-called health centre. It is the application of the approved methods of public and personal hygiene to all the people of a restricted community in order not only to better these people but to demonstrate the advantages which accrue in increased comfort, diminished sickness and death and general prosperity to all those who are not living on a high plane of physical well-being. It is believed that through these health centres, efficiently administered, the cause of public health can be more effectively and generally furthered in the immediate future than in any other way.

The term "health centre" is by its very nature difficult to define. Its organization and activities differ somewhat in accordance with the needs of the area it serves. In general it may be said that it is a place which combines the administrative health functions and other health promoting efforts of the community and secures their effective coördination for the service of that community. It should be the means of securing *community service in health*. Already in America there are more than 200 so-called health centres but few of them are complete or ideal in their administration. In order to carry out the plan there should be a physical headquarters, a *health promoting* program, a definite attempt to reach all the members of the community, preferably a political unit, and the co-ordination of all existing operating agencies, health and social.

It is therefore desirable that a political unit, one or more wards in a city or a town or a county be chosen, of which there are already data as to sickness, births and deaths, etc., for comparison later on, that the results obtained in improved health conditions can be demonstrated.

As already has been intimated the list of activities undertaken through a health centre is a long one; no centre embraces them all or even a considerable portion of them. Many of them are the usual functions of the Health Department or other governmental authority and would not be duplicated in an area where these official duties were being effectively carried out. There is nothing, however, concerning the health and well-being of a community which may not be undertaken by a health centre if there is need. Certain centres are securing accurate registration of vital statistics, the medical inspection of schools, general sanitary inspection, laboratory diagnoses, and are conducting health exhibits, classes for diabetics, domestic science and first aid; are maintaining a training school for nurses, well baby clinics, emergency hospitals and operating rooms, a general public health library and museum, public baths, and clinics in the various departments of medicine.

Two activities, however, are emphasized in nearly all centres—clinics for the sick and nurses for home visiting. These clinics may be conducted by hospitals already established but the health centre correlates the work and attempts to bring for examination and treatment all the residents of the specific area needing this care. Two groups of cases have thus far received primary attention in most of the health centres already established, namely those having or having been exposed to tuberculosis, and infants and young children. The care of the latter includes the whole range of prenatal supervision, advice and instruction to mothers, the care and feeding of babies, the provision of clean milk, supervision of the homes and surroundings, inspection of boarded-out children, hygiene of children before and during their school years and all the usual activities associated with the conservation of child life. Nutrition classes can be conducted in the schools in a health centre with unusual advantage. In such an environment and with sufficient supervision, one should aim to reach and follow every child, interesting them in their development and teaching them to form proper sanitary habits.

To establish such a centre in certain backward communities would mean the undertaking through the centre itself of most of these forms of service In other particularly urban centres, where the health department and various hospital clinics and other medical and social agencies are active, the problem is one primarily of coördination, making the centre a sub-station of an *activated, alert* and *efficient* health department, through which there shall be a common and united effort to provide every dweller in the given community with information concerning healthful living, skilled medical oversight—the opportunity to live his life as freely as possible from the handicaps of ill health.

Without doubt the most outstanding function of a health centre is the dissemination of knowledge on matters pertaining to public health and personal hygiene. It is of course an aphorism to declare that if everyone knew the more important facts about hygiene and sanitation and applied this knowledge there would be little need for the public health work so essential today. Public health education is therefore perhaps the most pressing need, and this information should be distributed in many forms helpful to various elements in the community. The centre should become a familiar neighborhood station, from which are dispensed the most constructive influences in the promotion of physical well-being. It should make available to all the best circulars, books and pamphlets on the nature and prevention of different diseases, on exercise, fresh air, food, and the maintenance of bodily vigor. If possible, an auditorium should be a part of the health centre sufficient to accommodate an average audience assembled to attend conferences and lectures on health subjects. There should be provision for lantern slides, motion pictures, etc. A health centre in a community already organized should be a place where all the medical and social activities of the community are thoroughly known and rated so that directions can be given to inquirers concerning any desired service. Newspaper publicity is becoming more and more used by health centres as a means of disseminating their propaganda.

Printing publicity alone often fails to reach the goal, but when printed advice is personally explained in the home by health visitors it seldom fails to make a lasting impression. From the beginning in the formation of a health centre it should be the aim to develop the *resources of the community itself,* and in building up the work every effort is made to interest and enlist local support. Whenever possible, the leading citizens, both men and women in the community, are organized for specific work. The help of local physicians, social workers and religious organizations is sought and utilized and the community itself is made to see the great value of the program which is offered. No large number of people can be made good and healthy and kept so by influences solely from without, but when they appreciate and are willing to work for the end in view the result is assured.

In the establishment of such a centre the activities must be carried on with the approval and support of the health authorities; the whole effort being to set up an ideal *health administration for a limited area,* and one should look forward to the gradual taking over of work by the health department supported by an educated public opinion. In fact, the object of the plan is to demonstrate the value of just these methods of living which an up-to-date health department advocates but as yet has not been able to secure. It is equally true, however, that the assistance of various volunteer and private organizations and institutions having to do with public health are now essential to the successful carrying out of the program. In the history of sanitary and moral reforms the initial vision has been seen and the pioneer work has been commenced by individuals and voluntary organizations. The wrongs of slavery first burnt themselves into the soul of Wilberforce, the cruelties enacted in prisons aroused the righteous indignation of John Howard, and the cry of wounded soldiers stirred the sympathies of Florence Nightingale, and so it has been all along the line of human progress toward better things. Great souls and groups of volunteers have been the pioneers, the skirmishers, even the shock troops, and public officials, health departments, boards of education and what not, have slowly arrived on the ground and have undertaken to organize the territory already entered.

Perhaps more progress has been made in this intensive health project in the domain of infant and child welfare than in any other. But I know of no large community where such a plan reaches every baby.

One of the most thoroughly organized cities in the country in child welfare work is Cleveland, and yet the recent community survey shows that even there a satisfactory coördinated program is not carried out. Methods have been standardized and proved, but the necessary coöperation, means and leadership are not yet at hand to function adequately in a large city. In order to point to a successful experiment in child saving (almost the only entirely satisfactory one I am familiar with), one has to cross the water to the village of Villiers de Duc at the foothills of the Alps near where General Foch made his headquarters during the first battle of the Marne. In this village when a certain M. Morel became Mayor in 1854 he discovered that almost 30 babies out of every 100 died under one year of age. He called his people together and showed them that they were more successful in raising lambs and calves than babies. He suggested a simple practical program which resulted in an annual reduction of infant mortality, between 1854 and 1863 of 15 per hundred. On the death of Mayor Morel he was succeeded by 2 other men in turn, not interested in infant mortality and the rate rose again to 30 per hundred. Then came a second Mayor Morel, a son, a physician who devised a complete set of regulations for the welfare of the community which he enforced through his office. Every pregnancy was reported to him in the early stage. Breast feeding was encouraged with every baby; the Mayor's office was notified of every case of illness within 24 hours; regular medical clinics were held and an abundant milk supply was made available. These measures, vigorously enforced, resulted in saving the life of nearly every baby born in that village from 1894 to 1917. That is, all the children of Villiers de Duc in that period lived to grow up.

The great need in American communities today is a reproduction of this experiment. To do this the sympathetic coöperation of the *mothers* must of course be obtained. The truth of the statement is demonstrated by the results achieved by the shrewd benevolence of that far-seeing and generous Englishman, Benjamin Broadbent, Mayor of Huddersfield. In that English borough a pound was offered as a birthday present to every baby born in the district which attained the age of 12 months. The homes of the babies were visited, personal letters of instruction were sent to each mother on the onset of the diarrheal season and of cold weather, and as a result fewer than half the number of infant deaths took place in the 12 months. The vital features of these humane endeavors in a special field are the securing of the interest and coöperation of every individual in need of assistance and the provision of just the kind of prevention and of remedial supervision needed.

Whenever this course has been possible the results in child welfare work have been striking. Last year in Baltimore, for example, there were over 13,000 children under 3 years of age on the records of the Babies' Milk Fund Association. The mothers of one-third of these children, some 4,300, brought their children more than twice to the welfare clinics and were interested and coöperative. The remaining two-thirds brought their children less than twice and were less coöperative in obeying instructions, i. e., were not under satisfactory supervision. The total mortality of the first group was 1.8 per cent., of the second group, 4.7 per cent., and the death rate from nutritional and diarrheal diseases was .2 per cent. for those well supervised and 2.1 per cent. for those not coöperating. These figures can be duplicated doubtless in many other places. They are sufficiently stirring to present an irrefutable reason for the attempt to go further and reach effectively every baby, every run-about, and every school child in a given district so as to conclusively prove to the dullest voter that his continued indifference is potential murder, that the whole of his city and state can be as free from disease as that area covered by the health centre if he wishes it and is willing to pay for it.

No group of physicians should be more concerned in this movement than the pediatrician. The treatment of children leads irresistibly into the domain of preventive medicine. Could not each one of us give a part of his time to the furthering in our home neighborhood of a health centre where, in a limited area, health education and satisfactory standards of nutrition and preventive treatment could be provided for every child? If under such a demonstration, Q. E. D. could be written, everybody could be interested in keeping well, and there would be no preventable defects and a great reduction in morbidity and mortality rates; then one could complacently rest and leave to others the multiplication of these health centres until the whole country was covered.

It is no wonder that the American Red Cross is interested in the program of establishing health centres. It ought not to be said that this national organization which summoned under its standard practically the whole nation is quickened to activity only by temporary calamities but remains unconscious of the continued disaster of preventable disease and death that gnaw at the vitality and prosperity of the people.

Ignorance is the cause of this condition and health education is the great means of service by which this ignorance can be removed. The Red Cross seeks to transfer, so to speak, a large part of the activities of its 8,000,000 loyal workers during the war, from battle-scarred France where it helped the French mother to save her baby's life, and the French people to cope with disease. It will transfer these activities as far as possible to strategic centres in our own country where the same spirit will render to our own people the same kind of service which it gave so unstintingly to a foreign people. This is not the place to enter into the details of the organizations of a health centre. I have tried briefly to outline the great need and to indicate that to meet this real emergency the most practical immediate step seems to be the introduction of intensive methods of public and private sanitation as will reach 100 per cent. of the population of a restricted area, that thus the efficiency of these methods will be proven and, if proven, reproduced many times.

CEREBRAL REACTIONS IN PNEUMONIA (Bulletin Médical, March 5, 1921). The two children of 7 and 15 presented delirium and extreme excitement; in the older girl preceded by a stage of torpor suggesting coma. The symptoms seemed to indicate acute meningitis, but the spinal fluid was comparatively normal and the symptoms of pneumonia cleared up the diagnosis, and both recovered. These brain disturbances may take the form of convulsions, delirium or somnolency; the latter is most frequent and may accompany the rise in temperature. There is usually extreme hyperesthesia of the entire skin, and ocular disturbance is frequent, from ptosis to mydriasis and choked disk. The outlook is grave with suppuration in the meninges and somewhat serious even with serous meningitis. The latter may be followed by chronic hydrocephalus. Treatment must be prompt and vigorous. The main indication is to relieve the congestion of the nerve centers; hot baths are the best for this, given every four or six hours, or hot packs. Potassium bromid or chloral should be given to combat the cerebral agitation, with camphor in case of torpor. Lumbar punctures may relieve, but there is little use to repeat them in serous meningitis. If there is pus, the lumbar puncture should be repeated daily and antiserum injected, although the therapeutic action of this has not yet been decided.—*Journal A. M. A.*

THE TREATMENT OF THE EMOTIONS IN YOUNG PEOPLE.

By Tom A. Williams, M.B.C.M., Edin.,

Washington, D. C.

We must define what we mean by emotion. I should consider it as a reaction in the body without any reaction upon the environment. Emotions are not under the control of the will. However, we have the power of choosing the impressions which we wish and these, together with similar impressions, are elaborated into perceptions, which are abstracted into ideas. This we call thinking. Each thought contains both pleasant and unpleasant elements and it is merely a matter of attention which element shall predominate and the one predominating determines the emotions, so the emotions can be determined intellectually.

Since every emotion is accompanied by physical changes, it is important that a young person should acquire the right kind of emotions. We are familiar with the sagging back, the lack of ambition, which denotes habitual bad feeling, constipation, slow breathing, interfering with the internal organs. When the tone is optimistic, the signs are bright eyes, brisk walk, active breathing, good digestion, active mind. The way of looking at things is of utmost importance as has been proved without doubt by countless cases. Long ago Shakespeare made Hamlet say, "There is nothing good or bad but thinking makes it so." People have been said to fail to recover from thinking themselves ill. That is particularly true of the negro race. So that parents cannot be too particular about the way they deal with the feelings of children. If they are brought up with too much particularness, it develops a twist of mind which hinders the chance of success in life and interferes with social adaptation, which brings further ill health. We know that infants, taken from a foundling hospital to a home, have shown betterment of health. This is in a great part due to their response to the kindness which they have in a home, but which they did not have in a foundling hospital.

It is astonishing, to those not conversant, how early a child grasps responsibility and self-criticism and control. For instance, a boy 2½ had a habit of throwing a knife at a domestic. When he was seriously spoken to by his mother, he restrained for 3 weeks; then one night an impulse got the better of him and he threw it again. He came at once to his father and mother and said: "Daddy thrash boy, boy throw knife." An investigation as to the truth of this statement was made. After discussion, it was decided to accede to the boy's request and he fetched his slipper and was given the usual punishment. This was a self-imposed punishment. It indicated that he had a strong feeling of the right thing to do; that when he had given way he was thoroughly ashamed of his act and knew that amends must be made. This very strong feeling was so great he even imposed upon himself that which he greatly detested, namely, a whipping. No recurrence of giving way to this impulsive emotion has happened for 11 years. This boy's attitude was a love of justice, honesty, courage, and right action in general, and this one thing in particular, the emotional tone being developed toward a desire for justice, although the boy was only 2½ years old. Parents should never lose sight of the fact that in a child who is encouraged in expressing beneficial emotions and has the proper training, the emotions as an adult will take care of themselves.

We doctors, however, have to deal with the emotions of people which have made them sick; and the question of rectifying the emotions presents itself. I have under observation 2 young women in a finishing school in Washington, in each of whom there is a lack of adaptation. In the one case, it is the desire for affection which is shown somewhat impulsively and meets with rejection in consequence. The girl, however, has had her social adjustments much helped and is able to continue in school, much to her benefit. The other is hypo-pituitary and has been under treatment for 2 years; she was adjusting badly, wanting to leave school and go on the movie stage, being so beautiful a child. It was necessary to penetrate into the girl's character, a very difficult thing to do as she is very uncommunicative; and then to make a disposition so that she would acquire different ideals. In that way adjustments were made. When that is done, emotions take care of themselves unless they have become habits, in which case they must be dealt with psychologically.

Sitophobia in a Child. In January, 1912, a child, aged 11, was referred by a gastroenterologist, who was treating her because of dyspepsia and a capricious appetite. During the preceding 3 years, she had left school 3 different times because of her health. The only occasion on which any definite disease had occurred was six weeks before she was sent to me, a slight operation upon an infected corn. After this she had been dieted and seemed to improve for about 2 weeks; but during the week preceding my consultation, she had lost one and a half pounds.

Anamnesis. Upon going to bed she feels sick and weak, and pains shoot all through her; she has had a constant headache for several months. When she feels ill, she is very peevish; and she felt homesick for playmates, as she had made no friends in Washington where she had only been a few months. Instead of playing she sat or lay about most of the day, feeling too tired to fetch her books for reading, of which she was formerly very fond; she had also been fond of games formerly. She had had glasses since the age of eight, but had not worn them until lately. Her appetite was very poor.

Examination. Showed rather feeble reflexes; feet, flat, but not pathologically so; motility less vigorous than normal, especially in the ankles; unskillful diadococinesis; a tic of the shoulder; much wriggling; normal sensibility.

Psychologically, there were no intellectual abnormalities nor marked emotional reactions except that the little girl wept when it was proposed to take her away from her mother and father to the hospital. The mother had been very conscientious in the upbringing; and this had reacted on the child, before whom far too much attention had been shown regarding both manners and physical welfare. Conversation before her would frequently concern the appropriateness of different foods and their digestibility; and the atmosphere of the home was one of solicitude about the child's health.

As an infant, she was not retarded; she had been apt at school except in writing, when her hands would jerk; but they did not do so in sewing, in which she was skillful. Her bad writing in school disturbed her, and she would become "hysterical." Respiratory infections were easy and frequent, as was the case in her father. Perhaps this was accountable to mouth breathing; for this adenectomy was done when she was eight.

Diagnosis. As her physician assured me that the stomach functions were performed quite well and that he could detect no physical disorder of the digestive apparatus, and as the condition for the implantation of an idée fixe were apparent, and as conversation with the child herself corroborated my suspicion of this, it was evident that we were dealing with hysterical nosophobia. By this is meant a fear of disease implanted by suggestion, a matter very easy in young children and uncritical people in general. But it is quite exceptional for food and appetite to be the subjects of phobia in so young a child; for in the child the vegetative functions and instincts are usually paramount.*

While in Paris in 1906-1907 I saw one other case of this type of false gastropathy in a young girl (published by Déjerine since), and recently I saw one in a girl, aged 2½ years, for which one consultation sufficed.

Treatment. She was sent to the hospital on account of the nosophobia from which she suffered, the result of too much sympathy at home. When her parents left her, she wept bitterly; but she soon was cured by being made to breathe in quadruplets and by a little "jollying." She promised she would try to behave properly if her parents were allowed to visit her. The promise that they may do so stopped the weeping for 24 hours; the visit was postponed however. She was encouraged to play with another little girl patient; and this she came to enjoy so much that she ceased to ask to go home. When she had become quite contented and happy she was allowed to return home, where she has remained well ever since.

The treatment in the hospital consisted of creating an atmosphere round the little patient designed to show her how trivial were her own preoccupations about what she should eat as compared with the real suffering and disabilities of the patients round her in the ward. Of design she was placed in the open ward in preference to a private room. She was shown to what degree her feelings and behavior were under her own control, and no solicitude was shown about whether her food would agree with her or not.

It is not possible to set down in detail the numerous measures used to destroy the inconvenient suggestions to which she had been subject so long. While the therapeutics inevitably contained a modicum of suggestion, yet the end worked always for the giving of a rational understanding to the little patient of why her symptoms had occurred and how to prevent them in the future. In other words, the modus operandi was persuasion and reeducation. Towards this the hospital furnished a valuable aid, but not merely because it was a hospital, but because the nurses were intelligent coadjutors in the case. The child had been too much derationalized to have been manageable by office consultations alone, unless the mother had been able to collaborate, which she was unable to do, not from the lack of intelligence or conscientious desire for the good of the child, but because she had not understood the psychological mechanism of the daughter's illness. The mother's reeducation was much more readily effected when uncomplicated by the child's presence. Its success was shown by her successful management of the child when she returned home, for eighteen months later there had been no further trouble.

---

*The ideas which disturbed this child's emotions were not fundamental character-distortions which would have required a more complex reconditioning (see "Juvenile Psychasthema," Amer. Jour. Med. Sci., 1912) but induced notions merely gained by suggestion.

In other cases, difficulties are bodily inadequacy or disease such as created by anemia. It is frequent in young people to find a low red blood count to be the cause of a general inadequacy at work and play. This recovers spontaneously after the anemia has been cured unless it has led to faulty habits of doing, thinking or adapting. If so, these must be reconditioned, a simple and rapid matter in skillful hands but in danger of being sadly bungled by the unskillful.

Among the emotions jealousy is a frequent cause of disturbance in the young. It is quite easily dispelled if dealt with wisely and explained to the child. I might cite a number of cases. A very frequent emotion is that caused by excessive diffidence, nearly always induced by injudicious management. A young woman because she was said to have a large mouth endeavored to talk with a small mouth and thus disfigured herself and her speech so that she was unable to take part in the dramatic exercises, which would have been beneficial to her. In that way her whole life was distorted and through a series of misfortunes she lost her life.

In another case, a young man was imbued with the idea he could not learn the classics and for this reason he led the life of an artist, for which he was unfitted, whereas he would have excelled in science, which required preparation in the classics. This was through the feeling of diffidence which had been induced by the contempt of an older brother.

In another case, the son of a senator who was so doubting about everything he did he could not dress himself in the morning. —30 years of age and still had to be dressed by his father or mother or both. Sometimes it would take 2 or 3 hours to get him dressed. This man had been made diffident by the over-protection of his parents. When gradually I induced them to relax their solicitude he developed so that after 2 years he was able to handle himself in life by managing a farm.

Of course, the commonest of all emotions is fear. (See Psychogenetic Disorders in Children, Amer. Jour. Med. Sci., 1912.) Many will remember the lad who feared wild animals would jump on his back, whose impulsions were taken for epilepsy. One interview led to control of this impulsion.

Stammering and tics are very frequently products of emotion. They can be removed only when the cause of that emotion has been dealt with. (See Tics and their Treatment, ARCHIVES OF PEDIATRICS, JAN. 1909.)

1716 K Street.

STENOSIS OF THE PYLORUS IN INFANTS (Nourrisson, Paris. Sept., 1921). M. Péhu and X. Pinel have been able to compile only 38 cases of this affection in France, including 7 personally observed, and only 17 cases in Italy. These small figures from the Latin countries are in marked contrast to the hundreds of cases reported from Anglo-Saxon and German countries. They compare the records, and say that to date nothing has been discovered that will tell positively whether the *maladie pylorique* is of an organic or functional nature, and hence whether medical or surgical measures should be applied. Even the evolution and the results of treatment do not allow a retrospective diagnosis of the variety of stenosis, whether it was from malformation or spasm. Their views as to the nature and treatment differ from those currently prevailing, they say, as they will describe in a following article.—*Journal A. M. A.*

SOCIETY REPORT

THE NEW YORK ACADEMY OF MEDICINE. SECTION ON PEDIATRICS.

Stated Meeting, Held November 10, 1921.

MARSHALL C. PEASE, M.D., *in the chair.*

X-RAY DEMONSTRATION OF RUDIMENTARY DEVELOPMENT OF BOTH ARMS, WITH LACKING ELBOW JOINTS.

DR. CHARLES WINFIELD PERKINS gave this demonstration. He stated that the first illustrations were from a case that came to the Seaside Hospital—a young boy about 12 years of age, with rudimentary arms. He was otherwise perfectly developed and his mental condition was bright. With these 2 rudimentary arms the boy was able to dress himself, put on his shoes and with the right hand he was able to write his name. The radiographs showed that there were no elbows and only a rudimentary radius and ulna on the left side and rudimentary fingers. The left arm was smaller than the right. From the shoulder to the wrist there was but one bone with the effort at the development of a radius and ulna. On the right side, there was but one bone from the shoulder to the wrist. An operation was undertaken at one time with the object of making an artificial elbow joint, and there was a little bend to the arm which gave the boy better function than though the bone was perfectly straight. On the right side there was fusion between 2 of the metacarpal and phalangeal bones.

X-RAY DEMONSTRATION OF CONGENITAL MALFORMATION OF THE HEART IN AN INFANT OF THREE MONTHS.

DR. CHARLES WINFIELD PERKINS presented illustrations of the chests of children from 9 years of age down, showing the normal position and size of the hearts at different ages. These were taken all at a distance of 6 feet from the tube. He also presented a diagram superimposed over a roëntgenograph of a normal heart and chest of 9 years, showing the size of the heart, its position and the location of the valves. He stated that in the young children, under 4 years of age, the heart was more globular in shape and wider at its base than in older children. In making radiographs of the chest and hearts of children, it was essential that the child be absolutely parallel with the plate or there would be an enlargement at the base of the heart due to the oblique position of the patient showing the ascending aorta, which may mislead one in suspecting that it might be an enlarged thymus gland.

The radiograph of the congenital malformation of the heart which Dr. Perkins exhibited was that of a case referred to him by Dr. G. W. Graves, who had been called in on the case when the child was 2 months old. The child gave a history of choking and dyspnea from the age of 2 weeks continuously onward. A number of men of ability who saw the case were of the opinion that it was very suspicious of thymic enlargement. At first no signs could be elicited of any abnormality of the heart, by auscultation or percussion. The child, however, was cyanosed and blue. Two days before the radiograph was taken there were signs of beginning bronchopneumonia in the right upper lobe. The x-ray plate showed enlarged right auricle and enlarged left ventricle and a globular heart; the thymus was not enlarged as suspected.

The infant died 3 days after the radiograph was taken of suffocation more or less gradual in culmination, probably associated with bronchopneumonia. No autopsy was done. Diagnosis: Congenital malformation of heart associated with probable bronchopneumonia.

Discussion. Dr. Gaylord W. Graves stated that the infant with the normal heart had had a crowing type of respiration for a number of weeks. It was thought the case was one of congenital stridor, so-called Thomson's disease. That child was doing well.

The other patient with the globular heart showing dilatation had presented no ordinary physical signs of congenital heart disease. It had been the consensus of opinion of 3 physicians that this case was one of enlarged thymus gland. The respiration reminded one of that of a child suffering with laryngeal obstruction, as in laryngeal diphtheria, and was characterized by retraction of the intercostal spaces. The respirations, which were ordinarily about 50, at times became more rapid. There were repeated attacks of impending suffocation and seizures a little like convulsions. Several times the mother found the baby in a state of almost complete asphyxia and applied mechanical measures to affect restoration. The auscultatory signs where those of bronchitis; there was no cardiac murmur. The x-ray revealed the congenital cardiac malformation which would hardly have been detected by percussion and was not suggested on listening with the stethoscope even after the x-ray examination. Unfortunately there had been no autopsy. Congenital malformation of the heart without murmur was a comparatively common condition. Absence of congenital murmur has been explained at times by complete pulmonary atresia.

In view of the fact that symptoms of congenital malformation of the heart and those of thymic enlargement were thus sometimes similar, it would be wise to take more x-rays of infants in both the antero-posterior and lateral positions. Especially in cases of urgent dyspnea and asphyxia, if these were malformations of the heart, the x-ray might afford the explanation of the condition. Dr. Graves said it was a revelation to him that a congenital heart case could give such a clear clinical picture of thymus enlargement.

THE DIAGNOSIS OF PERITONITIS AND PERITONEAL EXUDATES BY MEANS OF ABDOMINAL PUNCTURE WITH CAPILLARY TUBE.

DR. BERNARD S. DENZER read this paper. (To be published in a later number of ARCHIVES.)

Discussion. DR. HAROLD NEUHOF said the question of abdominal puncture, as Dr. Denzer had pointed out, was not new. A number of years ago it had been shown that the abdominal cavity could be punctured for diagnostic purposes. Dr. Denzer however, had shown in a brilliant way some of the possibilities of abdominal puncture. The method he employed was one which was entirely satisfactory in his hands. Personally, Dr. Neuhof said he had had no experience with Dr. Denzer's technique but during the past 2 years he had been employing abdominal aspiration in conjunction with Dr. Ira Cohen, more frequently in adults than in children, for diagnostic purposes. They had been using a lumbar puncture needle and withdrawing with an aspirating syringe any peritoneal fluid that might exist. This method had proved safe in their hands. Various points on the abdominal wall may be chosen for puncture, all but that over the course of the epigastric vessels being safe. By making a minute incision through the skin, the sense of touch, which is the guide to the entrance into the peritoneal cavity, is best preserved. Further technical details would be out of place. The point is that there is no danger of injury to a loop of intestine unless the gut is fixed. In one case, in which it was necessary to introduce fluids into the jejunum at a laparotomy, he found that it was impossible to pass a lumbar puncture needle into the lumen unless the gut was fixed. If the method he was using was entirely safe, certainly the one employed by Dr. Denzer should prove free from danger. Dr. Denzer mentioned that the diagnosis of tuberculosis peritonitis might be established at a relatively early stage before ascites had become marked. It was in just such conditions as peritonitis that there might be contraindications to puncture as there was more likely to be fixation of a loop of intestine and under those circumstances one might enter a loop of intestine; the same was true in the presence of a mass in the abdomen unless one made the puncture far away from the mass.

As to the value of abdominal puncture in the diagnosis of peritonitis, they had had some very remarkable results, and had learned that even small quantities of fluid might be withdrawn by aspiration. The observations were substantiated by his operative findings. In his experience with the aspiration method in some 40 cases, only one was negative by this method in which fluid was found at operation and he believed that if Dr. Denzer's method had been employed fluid would have been found in that case as well. It seemed to him that Dr. Denzer's method was applicable to adults as well as to infants and children. One group of cases, in which the diagnosis was established and operation avoided by abdominal puncture, was that of pneumococcus peritonitis. In several cases they had been able to diagnose pneumococcus infection; one is then enabled to determine the type of pneumococcus and to employ serum therapy. In a number of cases, in which peritonitis was merely suspected, it was definitely revealed by aspiration. In traumatic cases they had found aspiration of considerable value. In one child, for instance, a condition was revealed by aspiration which had scarcely been suspected. The child was struck by an automobile in the left lower chest and was in slight shock. There was slight rigidity of the left upper abdominal wall, and some acceleration of the pulse. A diagnosis of an abdominal condition was entertained but the actual lesion was not suspected. By aspiration fresh blood was withdrawn, and at operation a ruptured spleen was found. Unquestionably, Dr. Denzer's method, as he had presented it, was a real contribution to the study of peritonitis in childhood.

DR. HENRY HEIMAN stated that this method of abdominal puncture had been adopted during the war. Dr. Lilienthal, after his return to Mount Sinai Hospital, advised the use of this method. They had had occasion to use the method on 4 of their cases, and in every one they had been able to establish the diagnosis of pneumococcus peritonitis. However, they had not employed the capillary method but had simply employed the smallest caliber hypodermic needle attached to the aspirating syringe. The point of entrance advocated by Dr. Lilienthal was one inch below and one inch to the left of the umbilicus. This avoided the attachments of the liver, and avoided puncturing the small intestines. The danger of puncturing the intestine was small, but it had occurred in one case, not yet published. In the smear were found a number of bacteria, but the child made a good recovery. It was not a pneumococcus case and there was no ruptured appendix. It was interesting to be able to type out the pneumococcus peritonitis cases. They had been able to type the pneumococcus in 9 cases. It was type I in 5 cases; type II in but one case; type III in no cases; and type IV in 3 cases. The method employed by Dr. Denzer was a distinct advance and he saw no reason why it should not be employed instead of the needle and aspirator.

DR. LEON T. LEWALD asked if this device could not be employed to introduce air or carbon dioxide into the peritoneal cavity if it became necessary to clear up a question of adhesions or of a mass. By the introduction of gas and an x-ray examination Dr. Denzer's device might be a diagnostic help from the x-ray standpoint as well as in the extraction of fluid from the peritoneal cavity. It seemed to him that x-ray examination might be combined with the removal of fluid while the tube was in place.

DR. DENZER, in closing the discussion, said he wished to show the type of needle Dr. Anderson and he had used in infants requiring intraperitoneal injections. This needle had an attachment in its shoulder permitting the insertion of a Luer syringe or a Luer adapter. They first tapped the mid-line of the abdomen, inserted the capillary tube and, after seeing that the peritoneal cavity was dry, attached a Luer adapter and proceeded with the injection of saline. This would permit a comparison of the method with the capillary tube and that of aspiration, which Dr. Neuhof had suggested. At present Dr. Denzer did not feel capable of passing judgment on the comparative values of the 2 methods. At the Nursery and Childs' Hospital, where the cases were obtained, the service is rich in medical material, but the surgical cases are scant and it took almost 2 years to collect these 6 cases. Stimulated by Dr. Neuhof's experience, aspiration was tried in several cases. In 2 cases blood was obtained and the method was discontinued. This should not militate against the method, particularly as one of the cases belonged to the group in which the transudate had been produced artificially.

The needle presented would permit the introduction of air or carbon dioxide at the same time that the test with the capillary tube was being made.

Dr. Heiman had brought up the question of the needle entering the peritoneal cavity. If a needle of a wide bore is used, this will not happen. At the autopsy table the effort had been made to enter the intestine, and in order to do so, it was found necessary to hold the gut firmly and to use considerable force. It is difficult to imagine the free gut permitting the entrance of the needle, provided the needle is of sufficiently large bore.

Dr. Denzer said that he did not wish to give the impression that abdominal puncture was a new method but that the use of a capillary tube was a new modification of it. They had used the capillary tube because they felt that aspiration must have been tried and to a certain extent discarded and because the capillary tube seemed safer. However, it would require a great deal more work before the real worth of the method is established.

THE LATE TREATMENT OF CHOREA AS A PROBLEM OF CONVALESCENCE.

DR. GEORGE R. IRVING read his paper. (See page 159.)

Discussion. DR. FREDERIC BRUSH stated that he had very little to add to Dr. Irving's paper except to note that the point might be lost unless one understood that before the Burke Foundation began its work there was almost no convalescent place for older boys with chorea, and they had been advised not to attempt them; also that it was not best to treat chorea along with other conditions, because the others would ridicule and irritate the choreics. As a matter of fact, the other boys did not badger the boys with chorea, but let them alone and thus induced normalizing more rapidly. It was nerve and mental therapy of the best kind. Separation of the children with chorea in some severer cases was tried but they always got better results if they were allowed to mingle in with other children. In convalescing in chorea there seemed to be a distinct turning point, occurring toward the end of the second or in the third week, after which came rapid improvement. One learned to wait for this turn, and not be discouraged. The figures gave less than 5 weeks as average stay, but that was because some came late in the course of convalescence or left for various reasons, before convalescence was completed. The right stay was from 5 to 8 weeks, the same as had proven best for the cardiacs. Heart complications were present more often than was given by the senders' diagnosis, and probably more than stated in the paper. Another impression which could not be expressed in figures was that a heart complication was nearly always a distinct disadvantage, lengthening the period of convalescence not so much as to nervous symptoms as by a slower restoration of good "general condition," which was the main aim. No claim to a more rapid elimination of choreic nerve symptoms was here made; but rather the plea for speedier general setting-up and normalizing through this active method.

OBSERVATIONS ON CEREBROSPINAL FLUIDS IN INFANTS AND CHILDREN.

DR. STAFFORD MCLEAN read this paper which presented an analysis of the findings in 250 specimens of cerebrospinal fluid obtained from the records of the Babies' Hospital during the past 4 years. All bloody fluids were discarded, as well as all fluids from all types of meningitis and poliomyelitis.

The records of the fluids were grouped according to clinical diagnosis, many of which diagnoses were controlled by autopsy. There were 35 cases in which the discharge diagnosis indicated some intestinal disturbance. In 4 of these fluids the cell count showed over 20 cells per cubic millimeter. Forty cases were tabulated in which the primary diagnosis was some respiratory disturbance. The average cell count for this group was 129 cells per cubic millimeter. There were 5 counts of 20 or more cells; one of these was 90, another 70, a third 62 and a fourth 60. "While it is true, as shown in the table, that the usual cerebrospinal fluid in acute respiratory infections is clear and colorless with a cell count of 10 or less, with a positive Fehling's test and a negative globulin, it is not uncommon to withdraw a clear fluid which contains over 50 cells per cubic millimeter."

Among 21 cases of defective cerebral development, the fluids were all clear and colorless and in only one instance did the cells number more than 12.

In 16 cases of hydrocephalus, 2 fluids showed xanthochromia, the others were clear. In one case with 91 cells, the autopsy demonstrated hemorrhagic staining of the dura, flattening of the spinal cord and hydrocephalus.

In 4 cases of status lymphaticus, proved by autopsy, there was nothing of special interest in the spinal fluids.

Among 4 neuropathic children, the number of cells in the spinal fluid was 2, 10, 15, 30 respectively.

In 26 cases of tetany, the spinal fluid was clear and colorless in every instance. The highest cell count was 30 cells per cubic millimeter.

In 7 cases of primary otitis media, the highest cell count was 10 cells per cubic millimeter.

In 4 cases of pyuria, the highest cell count mentioned was 10 cells per cubic millimeter.

Lumbar punctures were done in 6 cases presenting symptoms commonly expressed as meningisms, although Dr. McLean does not consider the term acceptable. In all 6 cases the spinal fluid was clear and colorless. In 5 instances it was under increased pressure and in 3 fluids the cell count numbered 15, 20 and 70 cells respectively.

Among 11 cases of congenital lues, 5 of which were autopsied, the fluid was clear and colorless in every instance and the highest cell count noted was 48.

Many other cases classified into groups according to diagnosis were reported by Dr. McLean, which will be published in detail later.

THE VALUE OF THE COLLOIDAL GOLD REACTION IN THE DIAGNOSIS AND TREATMENT OF EPIDEMIC POLIOMYELITIS.

DR. JOSEPH C. REGAN presented this communication which consisted of a study of 21 cases of poliomyelitis which were admitted to the Kingston Avenue Hospital during the autumn of 1920. A total of 74 special fluids were examined, the fluids being taken at intervals varying from the fourth to the one-hundred and twenty-third day of the disease. The curves thus obtained were classified according to the week of the disease in which the spinal fluids were taken. On this basis an average curve was constructed for each week from the first to the eighth; likewise an average curve for the fatal cases. The following conclusions were drawn from the study: There was always a reaction with colloidal gold solution in every poliomyelitis fluid examined during the acute stage of the disease. This reaction was constantly in the same zone with that of luetics. The average curves for the first and second weeks were very similar, and consisted in a gradually rising curve representing a graduated increase in reduction in ascending dilutions of the spinal fluid starting in the reddish-blue zone in 1-10 dilutions and extending into the lilac or purple zone in 1-40 to 1-80 dilutions, and then descending somewhat more abruptly into the reddish-blue zone in 1-160 and reaching the non-reducing or red zone in 1-640.

In the latter weeks of the disease, the average curve gradually subsided reaching normal in a minor proportion of the cases (3 out of 10), by the eighth to ninth week, while in the remaining 7 (70 per cent.) the curve was still elevated at the ninth week. In 2 cases examined later than the eleventh week, one being in the fourteenth and the other in the eighteenth, the curve was still elevated in both. The earliest subsidence of the curve to normal was the 28th day.

Cases presenting a persistence of the very acute curve of the first few weeks up to the ninth week or beyond commonly presented at this time either considerable residual paralysis with slight, moderate or marked polyneuritis, or else slight paralysis with a neuritis which was still pronounced. The writers are inclined to believe that there is a relationship between the duration of the positive colloidal gold curve and the acute inflammatory stage of the malady, so that when the gold chloride reaction becomes normal the acute period of the disease is over. If this is so the reaction should therefore be of value in determining when the rest of the acute stage may be terminated.

The gold chloride test had clearly differentiated in this series of cases the various forms of meningism—tuberculous meningitis, and epidemic meningitis. The only curves with which that obtained in poliomyelitis was apt to be confused were those obtained in cerebrospinal lues and in a minor proportion of cases of epidemic encephalitis. From the former the clinical symptoms, history and Wassermann reaction would afford an absolute means of differentiation, so that no mistakes could thus arise. Most cases of epidemic encephalitis gave a paretic, mild luetic or negative reaction. It was only those which presented a mild luetic curve which would, by means of the gold chloride reaction, be indistinguishable from poliomyelitis.

No close relationship was found between the cytology and chemistry of the spinal fluid and the colloidal gold reaction except in a general way. The reaction obtained in the fatal cases, although showing a tendency to produce greater reduction, did not differ sufficiently from those obtained in the non-fatal cases to make the test of value in prognosis.

It must be realized that the gold chloride reaction was the most valuable laboratory test we possessed at the present time for the recognition of Heine Médin's disease. To realize its full value it must be taken into consideration with the history, physical findings, and other laboratory data in the individual case.

Discussion. Dr. Martha Wollstein showed how comparatively rare abnormal spinal fluids are in the various diseases of infancy, excluding meningitis in its various forms, as Dr. McLean had done. She thought, however, that we must concede that the normal cerebrospinal fluid in infants differed from the normal cerebrospinal fluid in adults in that it contained more cells, the average in infants being 20 or even 25. In normal cerebrospinal fluid there was an absence of demonstrable globulin. In some cases of pneumonia and other acute infections there was comparatively often an increase of normal fluid from which inflammatory elements were absent. That kind of fluid was found in cases which for the want of a better name were still called meningismus. In other cases cerebrospinal fluid containing more cells of the polymorphonuclear variety with a slightly increased amount of globulin were present, and those cases were examples of serous meningitis, which was rather rare, but did occur. In their experience this type of cases usually ended in recovery.

DR. W. W. HERRICK stated that he considered Dr. McLean's paper important in that it was the first paper in which a collection of spinal fluids in a variety of acute diseases in young children had been placed on record. He was interested because he had published the results of a study of the spinal fluids of about 80 adults suffering from various acute infections. About one-third of these showed abnormal findings in the way of an increase in the nmber of cells or globulin in the cerebrospinal fluid. These were cases of pneumonia, bronchopneumonia, influenza, tonsillitis, scarlet fever, smallpox and other infections. In the clinical study of the early phases of acute disease one saw almost constantly severe headache, hyperesthesia, exaggerated reflexes and not infrequently vomiting, and their significance was perhaps that they were related to irritation in the meninges. Possibly this was evidence of a protective reaction consolidating the defenses of the meninges against infection. It was interesting to speculate that in the exanthemata it might be part of an allergic reaction on the part of ectodermic tissue, since in the exanthemata there were frequently changes which we recognized as serous meningitis. In smallpox there was severe headache, tremendous lumbar pain and vomiting. In the one case examined there was increased globulin and an increase in the number of cells in the cerebrospinal fluid. A great deal had been said as to the danger of lumbar puncture. Those who had had the largest experience were not convinced of the danger of a clean puncture with a small needle and the withdrawal of 3 to 5 c.c. of cerebrospinal fluid; this could do no harm in competent hands. It was important that the practitioner should recognize this and also that he should recognize that a slight increase in the cell count and globulin did not necessarily mean meningitis, poliomyelitis or one of the group of diseases characteristically involving the central nervous system and its coverings.

DEPARTMENT OF ABSTRACTS

CONDUCTED BY

WM. HENRY DONNELLY, M.D., Brooklyn, N. Y.

BLECHMANN and CHEVALLEY, M.: FATAL DIPHTHERIA IN A BABY ONE MONTH OLD WITH A NEGATIVE SCHICK TEST. (Le Nourrisson, January, 1922, p. 44.)

This case is cited to show that we should not depend too much on passive immunity with the negative Schick reaction which is found in the new-born and which is of maternal origin. It is advised that active prophylactic measures be carried out in institutions caring for children, regardless of the result of the Schick. Furthermore the rarity of diphtheria in the new-born is probably frequently due to the relative isolation of the infant, more than to the temporary congenital immunity to the disease.

W. H. DONNELLY.

DAY, HILBERT F.: EXPLOSIVE VOMITING; PYLOROSPASM; HYPERTROPHIC STENOSIS OF THE PYLORIS. (American Journal of Surgery, February, 1922, p. 20.)

Day gives the chief symptoms of pyloric stenosis as follows: vomiting, explosive in character; definite movable tumor in right upper abdominal quadrant; emaciation and loss of weight; visible peristalsis; constipation; obstruction shown by the x-ray. The treatment advised is operation by the Fredet-Rammstedt method. Unsuccessful results of this operation may be due to too late a diagnosis; mistaken diagnosis; bleeding point on the pylorus; ruptured mucosa; septic wound. The conclusions arrived at are: first, that the treatment of pylorospasm is medical; the treatment of hypertrophic stenosis is surgical; secondly, that essentials for success in surgical treatment are manifold. They are, early and correct diagnosis; complete separation of the pyloric muscle; good anesthesia; careful asepsis; careful closure of the wound and good after-care.

W. H. DONNELLY.

GUTHRIE, C. G., MARSHALL, B. C., and MOSS, W. L.: EXPERIMENTAL INOCULATION OF HUMAN THROATS WITH VIRULENT DIPHTHERIA BACILLI. (Bulletin of the Johns Hopkins Hospital, December, 1921, p. 369.)

The writers were able to produce the carrier state by the introduction of virulent diphtheria bacilli into healthy throats in 7 out of 8 cases. Four of these cases first developed clinical diphtheria and then remained carriers, and the other 3 did not develop clinical diphtheria and therefore may be termed healthy carriers. Neither a negative Schick test nor the preliminary injection of antitoxin prevents the lodgment or growth of diphtheria bacilli in the throat. The virulent bacilli found in the throats of healthy carriers were found to be capable of producing clinical diphtheria and did not differ from those obtained from patients with the disease. The bacilli retain their characteristics despite long residence in the human throat or transfer from one human being to another. The guinea pig was proven to be a reliable index of the virulence of the bacilli; and the Schick test was likewise proven to be a reliable index of the presence or absence of antitoxic immunity against diphtheria. Experimental diphtheria in human beings was shown to have a short incubation period, to produce marked constitutional effects, and to be accompanied by a sharp febrile reaction. It was promptly cured by the early injection of antitoxin in adequate dosage. W. H. DONNELLY.

HENSKE, ANDREW C.: TREATMENT OF BRONCHIAL ASTHMA WITH AUTOGENOUS DEFIBRINATED BLOOD. (Journal of the Missouri State Medical Association, December, 1921, p. 431.)

Henske reports that his method has given permanent relief in 56 per cent., temporary relief in 25 per cent., and was of no benefit in 19 per cent. The technic is simple and consists in drawing 25 c.c. of blood from the median cephalic vein, transferring it to a 4 ounce bottle containing 4 or 5 glass beads, and shaking for 10 minutes: when the blood is defibrinated it is filtered through sterile gauze. This defibrinated blood is then injected subcutaneously into the interscapular space or into the abdominal wall. The injection is repeated every fourth or fifth day until 7 to 10 injections have been given; if there be no improvement after the third injection the treatment is discontinued. W. H. DONNELLY.

NAVARRO, J. C., GARRAHAN, J. P., and BERETERVIDE, E. A.: MEDICAL TREATMENT OF HYDROCEPHALUS. (Archivos Latino-Americanos de Pediatria, November-December, 1921, p. 668.)

The writers, after careful clinical tests, believe that chronic, acquired hydrocephalus should be systematically treated by lumbar puncture and intensive anti-luetic measures; success will result in the majority of cases. Congenital hydrocephalus as a rule is not amenable to this or any other form of treatment.

W. H. DONNELLY.

DE STEFANO, SILVIO: LUMBAR PUNCTURE IN THE TREATMENT OF INTRACRANIAL HEMORRHAGE OF THE NEW-BORN. (La Pediatria, January 1, 1922, p. 12.)

De Stefano, from a review of the literature and personal observation, draws the following conclusions: (1) Lumbar puncture is definitely indicated in intracranial hemorrhage of the new-born; (2) it should be done as early as possible and repeated as often as the condition of the child requires; (3) it is a harmless procedure if properly carried out; (4) its effect, whether immediate or late, is that of a decompression of the nerve centers; (5) it may be combined with other measures such as administration of calcium chloride, injections of normal serum or of whole human blood. W. H. DONNELLY.

MARFAN, A. B., and LEMAIRE, H.: FREQUENCY OF SYPHILIS IN INFANTS WITH HABITUAL VOMITING. (Le Nourrisson, January, 1922, p. 1.)

The writers investigated a series of 57 infants with habitual vomiting and found that syphilis was certain in 33 per cent., very probable in 22.8 per cent., probable in 12.28 per cent.; thus lues was certain or probable in 68 per cent. of the cases. It is not claimed that syphilis is the only cause of persistent habitual vomiting in infants, but attention is drawn to the fact that 63 per cent.

of the cases responded in 10 days to specific anti-luetic treatment after other measures had failed. W. H. DONNELLY.

NOBECOURT, M.: TRACHEO-BRONCHIAL ADENOPATHIES AND INFECTIONS OF THE RESPIRATORY TRACT. (Medical Press and Circular, January 11, 1922, p. 32.)

This article is limited to those cases where tracheo-bronchial adenopathy exists coincidently with an infection of the respiratory tract. These cases may be grouped in 3 classes: (1) Tracheo-bronchial adenopathy which promotes the development and modifies the course of some of the commonplace infections of the bronchial tubes and lungs; (2) commonplace infections of the respiratory tract may set up reactions in the hypertrophied tracheo-bronchial glands; (3) infection of the respiratory tract may exist along with adenopathy in the same subject without one having any influence on the other. Like all lymphatic glands, the tracheo-bronchial group reacts in the course of infections of the trachea, bronchi, lungs and pleura; they swell and undergo structural change, and often the inflammation spreads to the connective tissue in which they are imbedded. Further, they receive, via the deep cervical glands, the lymphatics from the pharynx and larynx. Tracheo-bronchial adenopathy is so often tuberculous that we must always satisfy ourselves that tuberculosis is not present.

W. H. DONNELLY.

ELMER, WALTER G.: TREATMENT OF TUBERCULOSIS OF THE SPINE IN CHILDREN. (Therapeutic Gazette, January 15, 1922, p. 12.)

Elmer puts the early case, as soon as the diagnosis is made, on a Bradford frame, which is made slightly convex to slightly hyperextend the spine; also the spine is supported by 2 parallel felt pads which make the child lie on his transverse processes opposite the region of disease. A light bridle with Buck's extension at the head and one at each lower limb complete the appliance. This is continued with advantage for 3 months or longer and is followed by a plaster of Paris jacket with the spine in moderate hyperextension. After 6 months or a year of the jacket, an adjustable brace may be substituted, and the entire process of cure may occupy 2 years, if treatment is started very early, although, where a kyphosis has developed, it may take 5 to 7 years or longer. When a tubercular abscess develops, it is as a rule not disturbed (except possibly a retropharyngeal one), as dorsal and lumbar region abscesses may find their way slowly down to a point near the surface where they can be safely aspirated. Albee's bone graft operation is satisfactory as a fixation measure, but should not be done under 8 years of age. Patients should be in the open air day and night when possible and the diet should be nourishing with a quart of milk daily. When indicated, cod liver oil, with or without syrup of the iodide of iron, may be given. The most important therapeutic agent is sunlight and the nearer we approach the method of Rollier the quicker will our cases recover, with gradual deep tanning of the skin. Exposure to the sun may be continued 3 or 4 hours each day after complete tanning of the skin.

W. H. Donnelly.

Fordyce, John A., and Rosen, Isadore: The Treatment of Antenatal and Congenital Syphilis. (Archives of Dermatology and Syphilology, January, 1922, p. 1.)

Fordyce and Rosen believe that every prospective mother should receive a routine Wassermann examination; that the proper treatment of a luetic mother during pregnancy will undoubtedly result in the birth of a healthy infant. They also advise that every infant, born of a syphilitic father or mother, should have a Wassermann test made at birth; again 2 weeks later, then every 4 weeks up to 6 months, and afterwards every 3 months up to 2 years. If the reaction is negative after these tests, and no clinical signs have appeared, the child has probably escaped the infection. In infants having active clinical signs of lues but with a negative serological test, proper treatment should be instituted, as clinical diagnosis should take precedence over laboratory findings. The writers have adopted, as a method of choice, the systematic intramuscular injection of neo-arsphenamin and mercury, having obtained thereby a change from a four plus blood reaction to a negative one in fourteen out of forty-seven infants when the treatment was begun within the first few months of life. They are giving

6 to 8 injections of neo-arsphenamin in the course and make the initial dose 0.1 gm. for infants 2 to 12 weeks old; 0.15 gm. from 3 to 9 months; 0.2 gm. from 1 to 2 years, and 0.25 to 0.3 gm. for children 3 years old. These injections are given in a course of 6 to 8 injections at weekly intervals followed by a rest period of from 4 to 6 weeks, and 2 courses are given regardless of a negative reaction. The mercuric chlorid injections are 10 or 12 to a course, at weekly intervals, with the following dosage: 1/10 grain for children 2 weeks to 6 months old; 1/8 grain from 6 months to 1 year; 1/7 grain from 1 to 2 years; 1/5 grain from 2 to 3 years and 1/4 grain for those more than 3 years old. In very feeble infants it is better to begin with mercury alone, giving about 8 injections before the administration of neo-arsphenamin. The eye, neurologic and spinal fluid examination should be carried on as in adults. W. H. DONNELLY.

GREENTHAL, ROY M.: AN UNUSUAL EXANTHEM OCCURRING IN INFANTS. (American Journal of Diseases of Children, January, 1922, p. 63.)

Greenthal states that the cases observed by him, in patients whose ages ranged from 9 months to 2 years, would seem to be of a condition described by Zahorsky in 1910, and Veeder and Hempleman in 1921. The disease is characterized by a pre-eruptive period of 3 to 4 days with high fever. On the fourth day, there is a sudden drop in temperature coincident with an eruption, which lasts 1 to 2 days and is maculopapular, resembling measles. The etiology is unknown. W. H. DONNELLY.

DANIELS, AMY L.: CAN YEAST BE USED AS A SOURCE OF THE ANTINEURITIC VITAMIN IN INFANT FEEDING? (American Journal of Diseases of Children, January, 1922, p. 41.)

The most noticeable general effect of yeast feeding, especially with the younger babies, was an increase in the number of stools and a softening which often amounted to true diarrhea. Loss of weight frequently followed the diarrheal stools, and in one case boils actually developed in the course of the treatment. The writer's experience points to the conclusion that yeast should not be used as a means of increasing the antineuritic content of infants' food. W. H. DONNELLY.

LYON, ARTHUR BATES: BACTERIOLOGIC STUDIES OF 165 CASES OF PNEUMONIA AND POSTPNEUMONIC EMPYEMA IN INFANTS AND CHILDREN. (American Journal of Diseases of Children, January, 1922, p. 72.)

Lyon found that in lobar pneumonia, or empyema following, Type I pneumococcus was found in 29.9 per cent.; Type II in 3 per cent.; Type III in 7.1 per cent.; Type IV in 37.7 per cent. In bronchopneumonia the fixed types of pneumococcus are much less common than in lobar pneumonia, with common occurrence of streptococcus hemolyticus and staphylococcus aureus. These organisms have been followed by a particularly high mortality. There was an extraordinary tendency in Lyon's series of cases to the development of empyema with Type I pneumococcus; namely, nearly 38 per cent. W. H. DONNELLY.

SHIPLEY, P. G., PARK, E. A., MCCOLLUM, E. V., and SIMMONDS, NINA: IS THERE MORE THAN ONE KIND OF RICKETS? (American Journal of Diseases of Children, February, 1922, p. 91.)

The writers from their experiments are led to believe that there are 2 kinds of rickets; one characterized by a normal or nearly normal blood calcium and a low blood phosphorus; the other, by a normal or nearly normal blood phosphorus but a low blood calcium. If this hypothesis is correct, then the relation of tetany to rickets would appear to be as follows: Tetany is an expression on the part of the nervous tissues of an insufficiency of the calcium ion; rickets is an expression on part of the skeleton of disturbed relations between the calcium and phosphate ions of the body fluids. It is suggested that there is a possibility that there is a true renal rickets and that the rickets accompanying the alimentary anemias may represent a somewhat different kind of disturbance from that which is present in the ordinary forms of the disease. W. H. DONNELLY.

GITTINGS, J. CLAXTON, and DONNELLY, JOHN D.: CLINICAL VALUE OF INTRAPERITONEAL INJECTIONS OF SALT SOLUTION. (American Journal of Diseases of Children, February, 1922, p. 124.)

It was first proved by the writers on necropsy that it is practically impossible to perforate the bowel by the sudden insertion of a needle through the abdominal wall. They believe that forced ingestion of water by nasal tube should be given a more extensive trial before anhydremia develops, and if used in conjunction with the intraperitoneal route, other methods will rarely be needed. As a general rule it was found that from 20 to 30 c.c. of saline per pound body weight could be injected into the peritoneum of children under 1 year of age. The degree of dehydration should be controlled carefully by tests of blood volume, blood flow and protein concentration. Dehydration in itself must be an important factor in producing symptoms, and in determining the outcome, but it cannot be held solely responsible for the deaths in many cases of diarrhea. The bad result of the continuance of the diarrhea is as sure now as before dehydration was adequately recognized. W. H. DONNELLY.

GORDON, MURRAY B., and NEWMAN, BENJAMIN: GANGRENE OF THE FEET FOLLOWING DIPHTHERIA. (American Journal of Diseases of Children, February, 1922, p. 142.)

This case is only the fourth to be reported in America and the gangrenous process affected the heel of the right foot and the toes of the left foot. The case was one of diphtheria untreated up to the fourth or fifth day and the explanation of the gangrene was a resulting myocarditis with sluggish circulation, low blood pressure and insufficient collateral circulation. Surgical intervention was postponed owing to the early critical condition of the child and the later formation of a line of demarcation. Amputation was performed at the metatarso-phalangeal joints of the left foot 4 months after the onset of the diphtheria, and the boy, aged 6 years, left the hospital two weeks later. At the time of writing, the patient walked without any noticeable deformity.

W. H. DONNELLY.

ARCHIVES OF PEDIATRICS
APRIL, 1922
HAROLD RUCKMAN MIXSELL, A.B., M.D., Editor

COLLABORATORS:
Rowland G. Freeman, M.D....New York
W. P. Northrup, M.D........New York
Henry D. Chapin, M.D.......New York
Francis Huber, M.D.........New York
Henry Koplik, M.D..........New York
Walter Lester Carr, M.D...New York
C. G. Kerley, M.D..........New York
L. E. La Fétra, M.D.........New York
Royal Storrs Haynes, M.D...New York
Herbert B. Wilcox, M.D.....New York
Charles Herrman, M.D......New York
Wm. Henry Donnelly, M.D...Brooklyn
Frank H. Richardson, M.D...Brooklyn
Edwin E. Graham, M.D.....Philadelphia
J. P. Crozer Griffith, M.D.Philadelphia
J. C. Gittings, M.D.........Philadelphia
A. Graeme Mitchell, M.D..Philadelphia
Charles A. Fife, M.D......Philadelphia
H. C. Carpenter, M.D.......Philadelphia
I. A. Abt, M.D...............Chicago
William P. Lucas, M.D...San Francisco
R. Langley Porter, M.D..San Francisco
E. C. Fleischner, M.D....San Francisco
Oscar M. Schloss, M.D. ....Boston
Maynard Ladd, M.D.............Boston
Charles Hunter Dunn, M.D....Boston
Henry I. Bowditch, M.D........Boston
Richard M. Smith, M.D.........Boston
L. R. De Buys, M.D........New Orleans
Robert A. Strong, M.D....New Orleans
John Foote, M.D..........Washington
Joseph S. Wall, M.D......Washington
B. K. Rachford, M.D........Cincinnati
Henry J. Gerstenberger, M.D..Cleveland
Borden S. Veeder, M.D........St. Louis
Frederick W. Schlutz, M.D.Minneapolis
Julius P. Sedgwick, M.D...Minneapolis
William Weston, Jr., M.D. Columbia, S. C.
A. D. Blackader, M.D.........Montreal
Edmund Cautley, M.D........London
G. A. Sutherland, M.D........London
J. D. Rolleston, M.D..........London
J. W. Ballantyne, M.D......Edinburgh
James Carmichael, M.D......Edinburgh
G. A. Wright, M.D..........Manchester

PUBLISHED MONTHLY BY E. B. TREAT & CO., 45 EAST 17TH STREET, NEW YORK.

ORIGINAL COMMUNICATIONS

MANAGEMENT OF THE NEWLY-BORN SERVICE.*

By L. R. DeBuys, M.D.
New Orleans. La.

In a previous paper (Southern Medical Journal, Vol. XV., No. 2, Feb., 1922), the writer called attention to the necessity of establishing the newly-born service, a service wherein the infant receives consideration beginning immediately after birth, and outlined a general plan for the conducting of such a service. In this article it is my purpose to describe more in detail the operation of this service.

It should be first made very clear that the establishment of the newly-born service is not intended to incur the antagonism of our closest workers, the obstetricians, but on the contrary to coöperate to the fullest extent with them and to relieve them of the responsibility of the infant. It also affords an opportunity for the pediatrician to study the infant immediately as he becomes an independent member of society and in this way he may be given the best possible start.

---

*From the Newly-Born Service of the Touro Infirmary and the Department of Pediatrics, School of Medicine, Tulane University of Louisiana, New Orleans, La.

Of course, the natal and prenatal epochs of life have their direct influence on the newly-born, but in the consideration of the newly-born we are assuming the responsibility of the individual as he is delivered to us.

It is well to emphasize the point that coöperation between the obstetrician and pediatrician is absolutely necessary for the maximum good to be accomplished by such a service. The obstetrician should certainly be willing to relinquish the responsibility of the infant as he is born and pass it to the pediatrician who has made that period of life a study. In this way the pediatrician can more thoroughly further study and investigate a period of life which has yet received very little consideration but which is most fertile from a scientific and humanitarian standpoint.

The obstetrician, on the other hand, is not deprived of anything in relinquishing the responsibility of the infant to the pediatrician. If the argument is advanced that the obstetrician should care for the newly-born, the reply can be offered that this period of life is foreign to his line of work; but if he feels that he is being deprived of a field of study he certainly has no complaint coming to him for the prenatal and natal periods of life, from the viewpoint of the welfare of the child, have received practically no consideration and offer a wonderful opportunity for study.

If the obstetrician would study the prenatal and natal periods of life and insist upon the pediatrician studying the newly-born and the period of infancy, there could be a correlation of ideas, coöperation of services, and an advancement in our knowledge of early life.

The actual management of my newly-born service at the Touro Infirmary includes both an inside and an outside service. The inside service is conducted along lines which we consider to be the best to our knowledge. We are continually modifying and improving the service and believe we are gradually approaching the ideal. Though this goal may be far distant and may be difficult to attain, the results of our present system are most gratifying and satisfactory. The inside service allows of closer observations than the outside for obvious reasons. The outside service is conducted as nearly on the plan of the inside service as possible by field workers who have the advantage of following the operation of the inside service, and who apply the ideas in vogue in the latter service as they are modified from time to time.

The Inside Service.—As soon as the cord is tied by the obstetrician, the infant is immediately transferred to the pediatric department. The cord is dressed by the doctor. The baby's temperature is taken immediately after he is born. A drop of a 1 per cent. silver nitrate solution is put in each eye. The baby is well cleansed with warm olive oil, dressed, and wrapped in a warm blanket. The temperature is taken when the baby is first brought to the nursery, and again in 6 hours. No bath is given before the baby is 24 hours old. The baby is put to the breast every 6 hours in the first 24 hours, every 4 hours in the second 24 hours, and thereafter at intervals prescribed for each individual case. There is a daily inspection of the navel cord and the date of its falling is noted. All stools are saved for examination. Temperature charts are kept and babies weighed daily. The babies are weighed by one appointed nurse. A 50 per cent. solution of alcohol is applied to the mother's breast before and after nursing. There is no bath given until ordered by me. The congenitally weak and premature infants receive no bath until their physical condition permits it; in many instances this may not be for several weeks. Cleanliness is essential, however, and these little patients are given oil applications externally without any friction and without being entirely undressed. They are not permitted to be handled and are fed by tube, if very feeble, but, if sufficiently vigorous, may be put to the breast. These cases are not allowed to go unfed until the mother's milk flows but are nourished promptly. There is usually sufficient milk from other women in the service to meet the demand. It is praiseworthy to see how willing these mothers are to help one another in these instances.

These little patients are kept warm by artificial heat, carefully regulated, and are placed in specially prepared cribs. Observations are made of them: their food intake, gastrointestinal symptoms, kidney action, temperature, etc., which are all accurately recorded. The weights are taken, when directed, and recorded.

The Baby's Day.—The baby's day consists in the usual care with some modifications. The daily bath, when ordered, is given at a temperature of from 98°-100°, and as rapidly as is possible, care being exercised not to too vigorously friction the skin. The body is powdered well with a bland powder and a change of clothing made, the clothes being of some absorbable material and of a light weight. The clothing is loose. After the initial attention to the eyes, nothing is put in them, but any secretions are mopped away with the eyes closed. The mouth also requires the application of no antiseptic, only sterile water is employed in its cleansing and this cleansing is done without any unnecessary roughness. The outer ear is cleansed—nothing is introduced into the auditory canal. Naturally the room in which the baby is bathed and dressed is a warm one.

Temperature, weight, respiration and pulse charts are kept for each baby. All stools are kept for inspection. Record sheets show at a glance what the progress is for several days. On one sheet, besides the temperature, weight, pulse and respiration, are included: the food and feeding hours, interval, complemental feeding (if any) and how administered; record of stools and their description; space for recording notes upon vomiting, urine, etc., and space for directions and remarks, so that at a glance the whole picture of the happenings in each case is immediately grasped.

The Daily Rounds.—The daily rounds consist in the study of the records, observations upon the baby, study of the mother's breast, and a close inspection of the stools. Notes are recorded upon each of these. By making these close daily inspections we have found that the earliest evidence of any abnormal situation is recognized and readily corrected with the least amount of effort on our part and inconvenience to the patient. This opportunity for the study of the diseases of the newly-born is most excellent and allows for the practice of preventive pediatrics.

In the daily inspection of the breast, preventive measures promptly instituted can spare the mother much inconvenience and pain, assist in the production of milk, and make nursing more successful and more pleasurable to the mother.

The nipples should first be put in proper hygienic condition, if they are not already, and then kept so. Some nipples are especially tender and require a little hardening; others do not. The routine employed consists in cleansing the nipples after each nursing with a 50 per cent. alcohol solution in water. Before each nursing, there is a 50 per cent. alcohol application, then the nipples rinsed off with sterile water. Of course, it goes without saying that only clean articles should come in contact with the nipples between nursings. When the nipples are especially tender, applications of a solution containing compound tincture of benzoin, 30 minims to the ounce, in equal parts of alcohol, rose water, and glycerin are begun promptly and made immediately after the nursing, in place of the 50 per cent. alcohol solution; and then ventilated nipple shields of aluminum are placed over the nipple so as not to allow the clothes to rest upon them.

By these daily inspections of the breast, we have been able to study the evolution of the nursing breast, and to make observations upon the axillary glands, which control observations will permit of the recognition of enlarged glands in the event of the development of inflamed breasts as contradistinguished from the normal glands in a firm hard breast, when at its maximum of hardness. It is gratifying to say that we have not had one instance of inflamed breast in the newly-born service since its establishment, but these observations referring to inflamed breast have been noted in the ordinary out-patient clinic. We have not had a case of caked breast, nor have we had a case of fissured nipples. When the breasts become firm and tense, we apply adhesive plaster so as to support the breasts, one piece extending from axilla to axilla below the breasts, and one piece from axilla to axilla above the breasts. These are placed so as not to come near the nipples and consequently do not interfere with nursing, but they support the breasts so that they stand right out in front of the chest. We have found this method better than any other. It is undoubtedly better than any brassiere and has the added advantage of not making any pressure either upon the breasts or upon the nipples, which pressure frequently results in sore nipples and sensitive breasts when the brassiere or binder is used. These adhesive straps are removed on about the seventh or eighth day after the milk is thoroughly established and the period of the firm breast passed.

In some instances, for the comfort of the patient, especially those with unusually large breasts, they are allowed to remain longer.

By the daily study of the stools of the baby, the evolution of the normal stool is readily noted and any deviation therefrom recorded and an explanation therefor sought.

It should have been remarked that in this newly-born service the infant has come into his own and is not looked upon as a by-product for he is admitted in the records of the hospital as a new patient promptly after birth and incidentally his discharge is not *ipso facto* issued with his mother's. He is not discharged until he receives a final thorough physical examination and is found to be O. K. In this way, should anything arise after his removal from the hospital, the records are clear. Should he be taken away contrary to our advice he is recorded as a "desert."

Upon discharge from the hospital, the mother is given printed information for her guidance in the care of the baby, and the baby is followed by the social service of the combined obstetrical and newly-born services. The mother is instructed to return to the newly-born out-patient clinic on the Thursday nearest the day the baby will be 4 weeks old. The discharge from the hospital is on about the eleventh day. About the fifteenth day, the baby is seen in the home either by a special nurse or by one of the field pediatricians.

The Newly-Born Out-Patient Clinic.—This clinic is held every Thursday morning. The cases coming to this clinic are placed into 4 groups and are card indexed as such. Those cases coming on their own day receive first consideration. Those cases which are discovered at the end of the morning's clinic not to have come are followed up by the social service. The size of the clinic has reached proportions very gratifying—our maximum attendance being 57 in one morning. This has necessitated the development of a system by which each patient is seen and completely examined with the least amount of loss of time or energy. The plan has been frequently modified and now consists in the following:—the patient with history enters the clinic, is undressed by the mother and is then temperatured and weighed by a trained nurse. The baby then progresses into another room where he is physically examined by Dr. Loeber, who dictates her findings to a clerk. The patient then enters another room where another set of examinations are made by Dr. von Meysenbug, who dictates his findings to another clerk. The patient then comes into my room where the mother's breasts are prepared for inspection, the baby placed on the table, and the stool exposed for examination. In this way the source of food supply (breasts), the consumer (baby) and the end results (stools) are studied. The records from the nurse and the 2 doctors are then read to me by my secretary while I go over the baby and add anything else that might be necessary. I then dictate directions to my secretary who takes the notes in shorthand. She then turns these notes over to another stenographer, who has the same system of stenography, and she in turn transcribes the directions in long hand and gives them to the mother with instructions as to when to return.

We have found it necessary to even have an extra door made into our clinic quarters so as to have a one way traffic through the clinic. In this way it has made the plan more efficient.

The results obtained in this newly-born service have been most encouraging and the coöperation and confidence of the mothers most gratifying.

Gangrene Following Measles (The Lancet, London, Oct. 8, 1921). Thorp cites the case of a child, aged 4½ years, suffering from measles which on the eleventh day of the disease developed gangrene of the toes of the left foot, and rapidly spread up the leg to the region of the knee joint, a well marked line of demarcation forming at the level of the junction of the upper and middle thirds of the tibia; at the latter part of this period of twenty-four hours a patch of dry gangrene was observed on the great toe of the right foot. The condition of the child was such that it was thought advisable to operate and it died on the fifteenth day of the disease.—*Journal A. M. A.*

THE SOUTHERN BABY

By W. A. Mulherin, M.D.

Augusta, Georgia.

The white southern baby will be selected as the representative baby of the South. I make this selection through no antipathy to the negro baby. Southern physicians give to the negro baby the same careful attention and consideration they give to the white baby.

Southern babies are the same as their northern, eastern and western contemporaries. It is true they show 100 per cent. Americanism when opportunity presents itself for asserting their rights. Possibly this pugnacious spirit may be an ancestral trait, dating back to the fighting spirit of the sixties. While troublesome, at times, it is helpful alike to babies and pediatricians, when serious illness occurs.

It has been said southern babies require different feeding and care. To a limited degree this might be true, due to no constitutional difference, but to different climatic surroundings. Intelligent pediatric practice, based on accepted pediatric principles, will properly care for southern babies, the same as other babies, without any fine differentiation in feeding and management.

Advantages. Southern babies have one distinct advantage over babies living in other parts of America. This advantage is *an abundance of sunshine,* and a *plentiful supply of practically always obtainable out-door fresh air.* Since Hess' valuable findings regarding the curative effect of sunshine on rickets, the explanation of comparatively fewer cases of rickets in white southern babies has been made clear. Of course, this decrease in incidence does not apply to negro babies, as pigmentation of skin naturally obstructs actinic rays. It is rare to see a negro baby, even breast fed, not showing some evidence of rickets.

It is my belief there are many curative, as well as vitalizing, properties in sun rays, of which we are totally ignorant. This belief, together with the facts there are few days in the year southern babies cannot be put out in the open to receive the benefits of sunshine and out-door fresh air, appear to explain the following personal observations:

Respiratory System. Respiratory troubles in southern babies are less frequent in occurrence, run a comparatively milder course, and result in fewer complications than in other sections of the country. It is a noticeable fact, there are fewer sinus and mastoid troubles in southern babies and children, than elsewhere. Likewise, there are fewer cases of empyema complicating cases of pneumonia, pulmonary tuberculosis, scarlet fever and other acute infectious diseases.

Tuberculosis. As would be expected, with plenty of sunshine and available fresh air, the incidence of local and general tuberculosis, amongst southern babies and children, is less than is found in more severe climates. The progress and improvement in such cases are more satisfactory, so-called cures are more numerous, and recurrences are less frequent. It might be mentioned that primary tuberculous peritonitis and tuberculous enteritis are rarely found in southern babies and children. Tuberculous meningitis is comparatively uncommon when one considers the frequency of its occurrence in northern and eastern cities. The same might be said regarding bone and glandular tuberculosis. They are less frequent and fare better in southern climate.

Nutrition. The South has its proportionate share of malnourished babies and children. These cases exist in spite of climate. They are found chiefly in rural districts. The 4 leading causative factors in producing malnutrition are improper feeding, poor hygiene, hook-worm and malaria.

Scurvy, considered a disease of faulty nutrition, naturally would be expected to be prevalent in the South. Such is not the case. Scurvy is rather a rare disease in white southern babies. I believe this fact may be accounted for in 2 ways: First, *more southern mothers nurse their babies than is the custom in the North and East*—I will not say in the West. I know Sedgwick, Fleischner, Abt and Cooley have done excellent work in promulgating the truth about the practicability of maternal feeding. In addition to the more extensive practice of maternal feeding in the South, mothers in rural districts usually give a taste to baby of almost everything on the family table. This early variety of diet may, in a measure, account for its scarcity. Second, may it not be due to the generous supply of sunshine in the southland? There exists a certain relationship between rickets and scurvy.

We at one time believed rickets to be entirely due to faulty nutrition. May not the sun's rays, in some unknown way, be a contributing preventive and curative factor in scurvy, as well as in rickets?

Rheumatism. Southern children may rightly claim advantages in climate, where rheumatism is concerned. In the South there exists comparatively fewer cases, courses run milder, fewer cardiac complications follow, and less recurrences occur than elsewhere. Cardiac cases do exceptionally well when sunshine and fresh air are combined with rest and judicious management. In this connection, I might add, tonsils and adenoids are not as luxuriant in growth, or of as frequent occurrence, as found in colder and damper localities. For this reason cases of acute and chronic otitis media progress better, and have fewer unsatisfactory results than the general run of such cases.

The Specific Infectious Diseases. As fumigation has been relegated to the past, and instead sunshine and fresh air advocated, it seems logical that southern babies and children with such diseases would have less to fear than babies living in less balmy climates. I believe clinical observations prove this to be a fact, especially as it pertains to scarlet fever, measles, diphtheria, pertussis and influenza. Epidemics of these diseases are less constant, less extensive and less virulent, and complications and sequelae follow in fewer cases.

This article is not written as propaganda for the South, merely a statement of facts, as I see them. Every southern physician knows the wonderful help he receives from our sunshine and out-door fresh air, in treating babies. They naturally glory in the many sunshine days and balmy climate. With pardonable pride they believe it to be the garden spot of America, or, as expressed in southern parlance, "God's own country." This may or may not be true. However, the fact remain, they are blessed with 2 very important assets, as they pertain to the life, health and happiness of babies and children, *sunshine and plenty of available fresh air.*

DISADVANTAGES. A spirit of fairness demands that disadvantages, with which southern babies have to contend, be mentioned. First, however, let me correct the very erroneous impression, existing in some sections of our country, that the South is extensively infested with typhoid, malaria and hookworm. The

South has all of these diseases, much more than desired, but not to the extent generally believed.

Typhoid. Infantile typhoid is just as rare in the South as in other sections of the country. This may be explained by the fact that typhoid is no more prevalent in the South today than elsewhere, also it is extremely rare for a typhoid mother to convey infection to her nursing baby. Childhood typhoid, 10 years ago, was fairly prevalent in the South. Today, I seriously doubt if there be more cases in the South than in other parts of America. The reasons for this are, typhoid in the South does not exist as extensively as is believed, also, typhoid vaccine is quite freely used. Again, Southern State Boards of Health are most active and efficient in their work along preventive lines. The water and milk supplies have yearly improved, and while as yet not all that could be desired, good work is steadily going forward.

Hook Worm. Stile's observation, some 15 years ago, of a general hook worm infection throughout the South, was correct. A great deal of this infection still exists. It is confined very largely to rural sections, few cases being found amongst city children. It is rare to find it in the baby (birth to 2 years of age). Unsanitary surface privies in rural districts appear to offer the best explanation for its prevalence in rural sections. Health authorities have been, and are, constantly and effectively fighting this menace to southern children. The incidence of hook worm has been lowered within the last 10 years, I should say, fully 50 per cent. However, there is still great need of constant and persistent work along this line. Oil of chenopodium is considered the safest and most effective medicine in the treatment of this infection.

Malaria. The idea that the large majority of southern babies have malaria is erroneous. It is true a goodly amount of this infection still persists in the South. Probably it would be a fair estimate to say that 15 to 20 per cent. of southern children have, or have had, malaria at some time during their lives. Each year the number of cases is becoming fewer, and the severity less pronounced. Proper drainage of swamps, stagnant ponds and pools of water, spreading oil on surface of water in swamps and in ditches, regular flushing of city sewers and later oiling them, screening houses and protecting babies and children with netting, have yielded excellent results.

Digressing slightly from my subject, I would like to mention a few clinical observations on malaria that might be worthy of consideration. Enlargement of spleen, in the first week of illness, generally considered of great diagnostic value, is absent in fully 35 to 40 per cent. of cases of malaria in infancy and early childhood. By enlargement is meant a palpable spleen, under careful examination.

A fair number of babies, breast fed, receiving plenty of breast-milk, blood showing malaria plasmodia, will apparently run no fever, grow indifferent to nursing, stop gaining in weight, or lose slightly, and grow decidedly anemic. This condition will have existed for some 3 or 4 weeks before medical advice is sought, and the blood examined. Physical examination will result in absolutely negative findings, in 35 to 40 per cent. of cases with no enlargement of spleen, and nothing to guide one to diagnosis, from clinical picture, except the marked anemia. These cases might be classed as subacute types of malaria, and naturally would be expected to show a higher percentage of enlargement of spleen.

Periodicity is one of the chief characteristics of malaria in the adult. In Georgia, and I believe the same applies to the South, periodicity in subjective and objective symptoms of malaria in infancy is oftener absent than present. The fever is remittent, more frequently than intermittent. This is not due to a preponderance of aestivo-autumnal infection, but is seen in tertian infection. The likely explanation may be found in the blood picture of tertian infection in the infant. Here all stages of development in the tertian infection are seen, more so than in the adult. The 48-hour cycle of maturity of plasmodia, in the infant's blood, is probably not completed with the same regularity or periodicity as happens in the adult. With the cycle of maturity being more continuous than periodic, remittent, rather than intermittent, fever would be expected. The same frequent absence of chills, or its equivalent, in babies (cold hands and feet, blue lips and nails, slight cyanosis or pallor, drowsiness or prostration) would somewhat substantiate this assumption.

In infancy, gastric and intestinal indigestion are not uncommon symptoms in the early stages of malarial infection; vomiting in about 75 per cent. and mild diarrhea in 25 per cent. would be, I believe, a fair estimate. In general, it might be said, malaria is a "great disturber" of the normal functioning of the baby and young child's body. If they possess latent tetany, tendencies to asthma, or bronchitis, malaria will frequently excite them to activity and give a very varied clinical picture. Therefore, it is the microscope, as well as the clinical picture, that guides the southern physician in making a correct diagnosis of malaria.

Infectious Diarrhea (*Ileocolitis*). Due to hot summer months, prevailing in the South, naturally one would expect infectious diarrhea to be extensively prevalent. Such was the case a few years ago, due to poor grade of pediatric practice, questionable milk and water supplies, feeding unboiled milk to babies, too much artificial feeding, and a failure to put babies out in the open air, in the shade. At present the incidence, the severity of the infection, and fatal terminations, have been decidedly reduced. I have my serious doubts if many more cases will be found during the summer months in the South than in other sections of the country, except on the Pacific Coast.

Southern babies stand southern heat well, they are acclimated, and are able, owing to dryness of atmosphere, to radiate excessive heat easily from their bodies, by free perspiration. They have plenty of free circulating air, not stagnant heat of tenement houses, or less free circulating air of crowded cities, most potent factors in producing these troubles. They are kept on lawns, under the shade of trees, or on shady piazzas all day, and during the night, when advisable.

Again, 50 per cent. more southern mothers are nursing their babies at the breast, than was the custom 5 years ago. Today, complemental breast-feeding, with final goal of entire breast-feeding, is extensively and successfully practiced in the South. At present a distinctly better grade of pediatrics is practiced in the South than was formerly the case. Improved inspection of milk and water supplies, screening of houses and porches, boiling milk fed to babies during summer months, sensible propaganda on infant hygiene and feeding by southern states' health departments, have all combined to successfully and intelligently handle the infectious diarrhea proposition.

PEDIATRIC ORGANIZATION IN THE SOUTH. Prior to 1916 pediatrics was unorganized in the South, and rightly had not a very high rating. Today, southern pediatrics is entitled to more favorable consideration. Pediatrics in the South is better organized today than any other branch of southern medicine. In 1916, a Pediatric Section was organized in the Southern Medical Association, and held its first meeting in Memphis, Tenn., in 1917. The Southern Medical Association's territory covers the entire south, the 16 southern states, and the District of Columbia. The success of the Pediatric Section, from the start, plainly showed the demand and necessity for organization of southern pediatrics. Enthusiasm and marvelous growth have been outstanding features in its development.

The last A. M. A. 1921 directory gives the names of 673 southern physicians, specializing in pediatrics. Five years ago, I will venture to say, there was not one-fifth this number. These numbers include physicians having Pd. with asterisk affixed, and Pd. without asterisk. The vast majority of these physicians are members of the Pediatric Section of the Southern Medical Association.

The slogan of the Pediatric Section is "Better Pediatrics in the South." To accomplish this the Section has developed along two well defined lines: (1) To have every southern pediatrician as an active and interested member of the Section. Also to yearly improve its scientific program, along clinical and scientific lines. This has been fairly well obtained, for the vast majority of southern pediatricians, as mentioned, are enthusiastic members of the Section. The yearly program has steadily improved in its clinical and scientific aspect. (2) To reach the general practitioners of the South, in order to elevate their standard of pediatric practice, and thereby secure a better grade of pediatric practice.

It was decided that contact with the general practitioners could be best accomplished by organizing a State Pediatric Society in every southern state. The word "Pediatric," in the name "State Pediatric Society," signifies more its line of work, than its personnel. Ten States have already organized and their State pediatric societies are actively functioning. They are mentioned in order of priority: Georgia, Mississippi, Florida, Kentucky, North Carolina, South Carolina, Missouri, Tennessee, Texas and Virginia. The remaining 7, including the District of Columbia, are in process of organization.

The object of a State Pediatric Society is to have a better grade of pediatrics practiced in the State. The general practitioners treat more babies than do pediatricians, owing to their relatively greater number. They are therefore very desirable members. Eligibility for membership reads: "Membership in good standing in State Medical Association, a desire to have better pediatrics practiced in the State, and a willingness to work to that end." The State Pediatric Society, as a component part of the State Medical Association, meets at the time and place of the State Medical Meeting. A morning or afternoon session on the general program of the State Medical Association is assigned to the Pediatric Society. The officers of the State Pediatric Society select broad-guaged, timely, non-technical papers, including in their preparation the latest and most approved pediatric ideas, for presentation. As one-fourth to one-third of the general practitioner's practice is pediatrics, and as it is an easy method to keep himself informed, State Pediatric Societies have steadily grown in popularity. Today they are considered by Southern State Medical Associations as filling a distinct need in the proper functioning of their organizations.

To make membership in the State Pediatric Society inviting and profitable to the general practitioner members, 4 or 5 leading pediatric subjects are assigned for 5 minute talks, at the yearly banquet. This banquet is held during the meeting of the State Medical Association, and is attended only by members of the State Pediatric Society. These talks, followed by informal discussions, are given by the pediatrician members, who are also members of the Pediatric Section of the Southern Medical Association. In this way a close relationship is established between each State Pediatric Society and the Pediatric Section of the Southern Medical Association. It is surprising how helpful and pleasing to the general practitioner members is this informal "clearing-house" system of disseminating valuable pediatric knowledge. In addition to talks and discussions, a constructive program for the ensuing year is outlined and directed to the most important and urgent pediatric problems of the State.

As the ultimate object and purpose of the State Pediatric Society is "better pediatrics for the State," and as the Division of Child Hygiene in every State Board of Health has, as reason for existence, the same object and purpose, naturally there should exist a close coöperation and mutual working between the two. Our State Pediatric Societies, and Divisions of Child Hygiene work in perfect harmony, and by such unity of action derive mutual benefits. The officers of the State Pediatric Society voluntarily serve on the Medical Advisory Board of the State Division of Child Hygiene. In this way another valuable adjunct is secured for the organization of southern pediatrics. Through this channel the laity is reached, and properly supervised literature and instructions on infant and child hygiene and feeding are disseminated.

A supposition might be presented to show the practical workings of the present organization of southern pediatrics. Let us suppose the Pediatric Section of the Southern Medical Association has some important pediatric information it wishes to be disseminated throughout the South. This information would naturally extend into every Southern Pediatric Society, and likewise into every Southern State Medical Association. Thence it would be passed on to the Divisions of Child Hygiene. Through these agencies it would ramify into every civic and voluntary society, interested in infant and child welfare work, in our southland.

It occurs to me if a similar plan of organization was adopted and put into active operation by the Pediatric Section of the American Medical Association, great good might result from it. If a State Pediatric Society was established in every State in the Union, it would decidedly improve general pediatric practice in America.

It is well recognized to-day that American pediatrics has developed to a very high point of efficiency. In this commendable development of efficiency are not pediatricians the chief beneficiaries? Would it not be a wise and justfiable move on the part of pediatric organizations of America to concentrate a little more on the pediatric needs of the general practitioner, thereby saving thousands of lives of babies and children? If such results were obtainable it might justify the organization of State Pediatric Societies throughout America.

It was not my intention or purpose to make the "Southern Baby" so long-winded. I have already mentioned he is inclined to be "scrappy," but not necessarily talkative. He is a happy and contented youngster when in his sunny South, and why shouldn't he be? With an abundance of sunshine, and an unlimited amount of out-door fresh air, a decided increase in maternal nursing in the South, sanitary conditions constantly improving, a well-organized body of determined physicians working for his 3 inherent rights—life, health and happiness—may he not be justified in his contentment? Also, may he not be pardoned for thinking in his inmost soul that he truly lives in "God's own country"? For he is a southern baby, the recipient of much distinctive and soothing enjoyment. Such native pleasures are his, as the inhalation of the subtle perfume from the jasmine and magnolia, the whispering of the fragrant pines, the crooning of that dear old melody "Dixie," whilst he is gently lulled to sleep in the arms of his faithful and dearly beloved old negro mammy—the personification of loyalty and devotion to the southern white family and its children.

ACUTE OSTEOMYELITIS OF THE RIBS (Policlinico, Rome, December, 1920). Fantozzi tabulates from the literature 50 cases of acute osteomyelitis of the ribs, and adds another case to the list. In the total 51 cases, 14 were in children under 5; 11 between 5 and 10, and 12 between 10 and 20. In 2 cases the costal osteomyelitis had followed shortly after furunculosis. Inflammatory lesions on the scalp are common in the history of the cases, as also eruptive diseases and pathologic conditions in the lungs. In 2 cases it followed measles; in 6, pneumonia, and in one, varicella. The infection seems to be always blood-borne. In 40 of the cases only one rib was affected, and the seventh rib was the one most frequently involved, while the first rib was never affected. In nearly half the cases a sequester was found. His list does not include any known tuberculous cases. The symptoms are those of a deep abscess. No instance is known of perforation into the pleural cavity. The conditions with which it is most liable to be confused are neuralgia, articular rheumatism, pleurisy and pneumonia, and, after the abscess has formed, mastitis, a subpectoral or pararenal abscess or empyema. It is probably more prevalent than is shown by the records, and diagnostic mistakes have probably occurred. The staphylococcus is the micro-organism generally involved, but in his case and in one of Canon's, the streptococcus was found. The data presented seem to show that the indispensable surgical treatment should be early and extensive.—*Journal A. M. A.*

SOME SOUTHERN FEEDING PROBLEMS.

By William Weston, M.D.
Columbia, S. C.

The feeding problems that we meet with in the South are in many respects the same as in other sections of the country. There are, however, certain differences, such as climate, manner of living, and most important of all, association of alien races, that create for us problems that are very unlike those that exist in other sections of the United States.

Here are 2 totally different races that have been living side by side for over 200 years. One, of pure Anglo-Saxon stock with centuries of British tradition and standards of living as a background. He has inherited and cultivated those traits of character and manner of living that make the Anglo-Saxon the outstanding race, and his the predominant influence in the world. On the other side, the negro, with African traditions, a low standard of morals and of living, whose freedom he has interpreted to mean an orgy of license. His religion a fetish, his spiritual guide a mass of superstition that influences his life from the minutest detail to matters of profound importance. He harbors and spreads disease. Each race has transmitted to the other race the diseases characteristic of the region from which he came. The white, the diseases of Europe, and the black, those of Africa. Upon arrival in Virginia and Carolina, they were for the most part isolated on plantations situated along the navigable streams, or on the seacoast, from where they spread inland. These groups were augmented from time to time by new arrivals from Africa, the West Indies, and the New England colonies. Each brought a new supply of disease. The European diseases, such as tuberculosis, pneumonia, measles and that universal disease, syphilis, found lodgment among these people and from time to time occured in epidemic form. The African brought malaria, uncinariasis and other African diseases.

The effect of the European diseases upon the African was not especially serious until after his emancipation, when discipline over him ceased, and paternal care came to an end. The effects of the African diseases upon the white race have been serious from the beginning. It will probably take several centuries longer before racial immunity is acquired by one race to the diseases brought by the other race, and until this time arrives, if it does, all of our problems must remain complicated.

Fortunately for the white race both malaria and uncinariasis are about to be eradicated. But, alas, for the poor negro, tuberculosis is ever present, is invariably fatal, and as long as he lives he continues to spread it. He is peculiarly susceptible to pneumonia and death is the usual outcome. He is by no means the powerful physical being he was in the plantation days of 50 years ago, and he continues to degenerate. It is no longer the custom for city or town negro women to nurse their babies. The poorest excuse for arificial feeding has been substituted. Syphilis among them is the rule, not the exception.

From the plantations they are drifting in increasing numbers to the towns and cities where they crowd in unsanitary quarters. These quarters are centers of vice and crime and foci of disease. The children in these communities are living witnesses of conditions, as here are found all degrees of malnutrition, all stages of rickets, tuberculosis and congenital syphilis.

Boards of health, welfare workers and associations of various kinds are diligently at work, but the task is of gigantic proportions and the results are most discouraging. Some of the best and most skillful physicians, actuated by a splendid spirit of philanthropy, have worked with a faith and hope little short of sublime in the endeavor to change conditions, but they have little influenced them. Until some method of general discipline is operative, conditions will remain about as they are or perhaps grow worse. General discipline is so repugnant to the principles of the federal constitution that it seems that the instrument that would have given them freedom has merely given them unhampered license to disappear from the face of the earth.

The thought naturally arises, how do these conditions effect their white neighbors, if at all? Naturally in many ways they effect the white race and influence his life as well. He realizes the perils and dangers that surround him. He is taking precautions in order that the members of his race shall survive and in living shall realize their full destiny. Space does not permit me to discuss more fully the situation as it exists in the South, but sufficient has been written to give those who are not already familiar with conditions some idea of the difficult and complex problems with which we have to deal.

The importance of breast feeding has not in the past been appreciated in the South, and not until within the last few years have even the most intelligent awakened to the realization that there existed an unnecessarily high mortality rate among infants. The social class depended in a large measure upon the employment of wet nurses with all the inconveniences and disadvantages incident thereto rather than nurse their babies. Many among the rural population were the victims of malaria or uncinariasis, in many instances both, and therefore did not give sufficient milk to satisfy the needs of their babies. Therefore condensed milk or some of the proprietary infant foods were resorted to to supplement or replace the breast milk. Consciences were easily soothed by the reassuring advertisements of baby foods that regularly appeared in the lay press. Physicians were misdirected by similar advertisements appearing in medical journals, and so their consent to substitute the proprietary foods for breast milk was easily gained. The harvest of death resulting from these false practices was appalling, but for a long time the real cause remained unrecognized. It was not until the bureaus of vital statistics were established that the truth in detail was made known to the public. We have endeavored to impress upon mothers that if they honestly desire to preserve the lives of their babies they must nurse them, and that to nurse them is a great moral and religious obligation, from which there is seldom safe escape.

We are trying to teach mothers that every young animal requires the elements contained in milk in order to grow and develop, that the milk of each species of animal differs from another in important respects, that frequently the milk of several members of the same species will differ to such an extent as not to be suitable to the young of the same species. The food requirements of the young of one species cannot be satisfactorily supplied by the milk of another species. Each has certain biological requirements and in order that these requirements be met it is important that the young of a species receive the milk of that species to which it belongs. It may be stated with equal assurance that the only way we may be sure that all requirements are met is by the baby receiving the milk of its own mother.

Human milk is such an unusual and extraordinary formula and differs so radically from the analyses of other milks that we cannot construct any formula that is just like it, either chemically or biologically. This especially applies to the ferments and alexins. An interesting example of the different behavior of the ferments in human and other forms of milk is when the casein of human milk is acted upon by rennin in the presence of hydrochloric acid it is reduced to a flocculent substance, while with the casein of cow's milk the result is a solid curd.

The behavior of those mysterious bodies, the alexins, is equally interesting. "All the alexins produced in the body of the mother, whether by experiment or disease, pass into the milk. These produce immunity to such experiments or diseases."

The biological advantages of human milk are so numerous that time will not permit me to enumerate them. Perhaps the most important of them is that when human milk is given the baby it prepares its gastrointestinal tract for its future work in life and has an important bearing in determining those characteristics that in after years we recognize under the composite term, character.

The chief clinical advantages of human milk is evidenced by the steady gain in weight and normal development that usually takes place in breast fed babies; due to the fact that breast milk is sterile and has a high bacteriolitic influence we seldom meet with gastric or intestinal disturbances in babies nourished in this way. Where hygienic conditions are normal and the baby gets a sufficient amount of fresh air and sunshine it is most unusual to find rickets in breast fed babies. This is also true as regards scurvy and may be accounted for by the fact that human milk is invariably rich in the antiscorbutic vitamine.

Every woman can nurse her baby entirely or in part for the greater part of the first year of its life unless she has tuberculosis, cancer or some other wasting disease.

Contagious disease in the mother is not a contraindication to nursing her baby. Nor does pregnancy during the first 3 or 4 months of its existence ordinarily constitute a good reason for discontinuing the breast. The re-establishment of the catamenia is not a reason for discontinuing the breast.

Most young mothers are anxious to nurse their babies, but are often menaced by doubt as to whether their milk will hold out, whether it is sufficient in quality or quantity, whether it agrees, since the baby has either colic with loose stools or is constipated. They invariably inquire which is the best galactagogue. Of course, this is a situation with quite as much psychology in it as pediatrics, and since young mothers are naturally inclined to stress their individuality and to exaggerate their idiosyncrasies we must be on the alert. Each case must be treated as an individual one. We can answer these questions with assurance of success by emphasizing the importance of nursing the baby at definite intervals, and for a definite number of minutes from each breast at each nursing. Explain, beyond the chance of misunderstanding, that the best galactagogue is the thorough emptying of the breast after each nursing and that the best breast pump is the thumb and forefinger. Give in detail directions for her diet. Emphasize the importance of exercise in the open air, and the importance of a daily warm bath. Instruct her to lay the baby down after nursing it. Not to shake or rock him. Keep him in the fresh air whenever the weather permits. Weigh him at definite periods, and record weight.

If *necessary* supplement the mother's milk with complemental feedings of properly modified cow's milk.

Weaning should be a gradual process beginning at the eighth month and should be completed by the twelfth month.

Feeding during the second year. This is the period to which mothers who live in a subtropical climate look forward to with great anxiety. Both tradition and experience are important factors in bringing about this feeling which approaches in many instances panic. Perhaps it is just as well that this feeling so universally prevails because, when people are afraid, the time is propitious to render aid and have it cheerfully received. It is an occasion when we may reasonably expect coöperation. Of course, babies that have been breast fed during the greater part of the first year, or even for a few months, do not present nearly so serious a problem as do babies that have been artificially fed. It is our experience that most artificially fed babies develop some form of indigestion with the arrival of the first hot spell of weather. Therefore, in prescribing a diet, we must keep in mind both the needs and dangers that may be encountered. The needs must be supplied, and if the child is not already the victim of some intestinal disturbance, we should anticipate such a danger and provide against it. Fortunately this can be very simply done if we know the child's food requirement and the elements that must enter into this requirement. It is important that we remember that in hot weather an infant requires a large amount of water and a relatively small amount of food, and this food must be low in carbohydrates, especially those that easily ferment. We find that our cases of fermental and infectious diarrhea are coincident in their occurrence with the marketing of berries and fruits (except orange, grapefruit and lemons) in the spring, and so we have become accustomed to look upon all uncooked fruits and berries as dangerous.

Regardless of the season, an infant requires fats, carbohydrates, protein and mineral salts in sufficient amounts to meet its individual requirements, and in addition to these elements the 3 recognized vitamines: fat soluble A, water soluble B, and the antiscorbutic. Normal milk will contain all these elements if the cows are healthy and are fed on a balanced ration which must contain ample fodder. Unfortunately these conditions do not universally prevail in this section of the country. The milk is often deficient in one or more vitamines, but in many of the small towns and in the rural districts care is not exercised in the handling of it, and it is unsafe for use in the raw state on account of bacterial contamination. Therefore it is advisable to bring milk to the boiling point for one minute. This is preferable to pasteurization, since boiling for one minute is less harmful to the vitamines, and is just as effective in destroying bacteria. If anyone should think that so short a period of boiling results in impairing the efficiency of the antiscorbutic vitamine, orange juice may be used daily.

In modifying the fats it is not advisable to reduce the percentage of fat below 2 per cent., unless for a short time to meet some clinical manifestation, such as vomiting. Even with a 2 per cent. fat we must be on the lookout for rickets before the gross symptoms appear. It is good practice to have roëntgen examinations of the epiphyses made on all babies receiving a low percentage of fat and who have been deprived of fresh air and sunshine by having been kept indoors over a long period of time. It is much safer from every point of view to use whole milk as soon as the baby can take it without producing symptoms of indigestion.

As a prophylactic measure, it has been my custom for several years to use *only* lactic acid milk from March 15 until about November 1.

During the second year the baby receives 4 feedings in the 24 hours of the articles mentioned below in such quantities as the child's needs require and circumstances make advisable:

First and fourth feedings: Whole lactic acid milk.

Second feeding: Cream of wheat or farina boiled one hour in water and served with butter that has been washed in cold water for 5 minutes. (In cold weather oatmeal or hominy.)

Third feeding: Soup made as follows: two tablespoonfuls of finely ground or macerated seed rice (care should be taken to preserve the fine powder-inner cuticle), sliced white potato, sliced young turnips or carrots, spinach, half cup of peas or beans. Boil in one pint of water for 2 hours. Add boiling water as water evaporates. Fifteen minutes before boiling period is over add one ounce of butter and salt to taste. Mash through coarse sieve and serve warm. In cool weather the soup is alternated with white potato baked in the hull and served with butter washed in cold water for 5 minutes and salt, and 1 or 2 ounces of freshly expressed beef juice. Fruit juice is given between the first and second feedings.

It has been observed after a trial of several years in which lactic acid milk has been given twice each day that the intestinal disturbances have been prevented. This method has been tried out in several communities that each spring, previous to its use, was visited regularly by severe epidemics of infectious diarrhea with a resulting high mortality. Since its use has become general in these communities, no epidemic has occurred, and the few sporadic cases that have occurred were where the measures advised were not used.

It is only fair to mention in this connection that other precautionary measures were advised. Among these were: boil all water where there was question as to its purity; keep the baby in the coolest part of the house during the heat of the day; protect him from flies and mosquitoes.

In intestinal indigestion, fermental diarrhea and infectious diarrhea, protein milk constitutes the diet.

Probably the most difficult class of feeding cases that come under our care are those of extreme malnutrition, athrepsia. Fortunately they are becoming fewer in number each year, as the feeding of infants is becoming better understood by the general profession. The elimination of this condition by prevention is not too much to hope for and may in reason be expected, since it is a condition of gradual starvation dependent upon a deficient or unbalanced diet. Many of these cases show such poor vitality that it may be advisable to give intravenous injections of a 5 per cent. glucose solution. These may be given in the superior longitudinal sinus in those children where the anterior fontanel has not closed. Ringer's solution may be given into the peritoneum. Transfusions of blood may be given, and may prove of inestimable value in tiding over a grave crisis. The feeding of these cases resolves itself into giving lactic acid milk diluted with a thick gruel made of seed rice and the addition of karo syrup (5 per cent.). As improvement takes place, add a thick cereal feeding. In a few days, if improvement continues, add a vegetable purée.

The feeding of cases of rickets and scurvy are essentially the same in the South as in other sections.

The feeding in cases of pellagra and acrodynia (ignipedites, krampsucht, kornstaupe, erythroedema, etc.), may be summarized under the directions given for feedings during the second year.

MENINGOCOCCUS MENINGITIS (Archives de Médecine des Enfants, Paris, Sept., 1921). Lewkowicz presents evidence that meningococcus infection occurs through the choroid plexus—the seat of the production of the cerebrospinal fluid—and thus it develops first in the ventricles, spreading thence into the subarachnoid space throughout. Woringer has recently reported two cases in which the communication between the ventricles and the subarachnoid space seems to have been blocked from the very first. The consequence of this was that the disease was limited to the ventricles, and the clinical picture differed from the usual type. Nothing but puncture of the ventricle explains such cases, and allows intraventricular injection of the antiserum. His two cases sustain Lewkowicz' assertions in regard to the inevitable primary ventriculitis as the first stage of meningitis.—*Journal A. M. A.*

NASAL SINUS DISEASE IN CHILDREN.

By Edward Clay Mitchell, M.D., and John J. Shea, M.D.,
Memphis, Tenn.

Introduction. We are meeting today in our practice a great number of sinus infections in children. Some are acute, but the greater number are subacute. There must be a reason for this increase of this specific infection and the reason is the fact that most of the so-called influenza cases were infections of the nasal sinuses. The adenoid cases, coming to reoperation because of failure to obtain relief from nasal obstruction, or perisistent colds, will be found on careful examination to fall into this class of infection. The material obtained by the diagnosis depends upon a careful history, nasal examination, and suction from the sinuses. Operative exploration may become necessary in maxillary sinuses, but usually better ventilation and drainage by removal of the tonsils and adenoid will allow treatment an opportunity to clear up the infection. The pediatrician is the first to see these cases, and their pulmonary symptoms mislead him. The close relationship of the sinuses to the pulmonary tract is due to the lymph drainage of the sinuses which is by way of the submaxillary and deep cervical and retropharyngeal glands into the cervical lymph duct, thence into the great veins into the right side of the heart, from where the pulmonary artery conveys it to the lungs. (Mullen.)

Anatomy. The sphenoethmoidal labyrinth is so closely articulated as to be considered as one structure and infection usually affects it as a whole. The maxillary antrum is present at birth and retains its entity throughout life. The frontal sinus is not present at birth, but at the end of the first year is in the process of formation, through the activities of the anterior ethmoidal cells.

Ethmoidal Cells and Sphenoidal Sinus. The ethmoidal cells are not present at birth (Dean). They develop until puberty is well established and reflect in their growth the influences of the infection they suffer. The sphenoidal sinuses are usually present at birth and mature at the age of 10 to their adult size. The sphenoethmoidal labyrinth will assume the size and shape that its component bones will allow. If the cells are thoroughly ventilated during their period of growth, they will be well pneumatized, but if their ventilation and drainage are obstructed by inflammation, they will retain their infantile structure. This later type is a prototype of the infantile mastoid and is prone to chronic infection.

Maxillary Sinus. The maxillary sinus is the largest and best developed cavity at birth and steadily increases in size until the eighth year, and reaches its adult size between the 16th and 18th year. In infancy the floor is relatively higher as compared with the floor of the nose, and during the first year of life may be above the level of the attachment of the inferior turbinated bone.

Frontal Sinus. The frontal sinuses are not present at birth and depend upon the migration of the anterior ethmoidal cells for their formation. As soon as the anterior ethmoidal cells invade the frontal bone, they pass out of the sphenoethmoidal labyrinth and can be considered the future frontal sinus. Again, ventilation and drainage during this formative period will determine the size of these sinuses. If the ethmoidal cells are blocked by inflammation, the sinuses may be absent or of rudimentary size. Heredity plays a part through its shaping of the bones of the face.

Pathology. The nasal sinuses, being lined by mucous membrane, are subject to all of the forms of inflammation that mucous membrane presents, and because of the membranes construction, blending as it does with the periosteum, undergo several peculiar pathological changes.

In the acute cases, there is an active inflammatory reaction of the membrane with a free flow of discharge. At first, the discharge is in excess of the normal secretion, but as the disease advances more pus cells are thrown out and the character of the discharge changes to mucopurulent, or purulent. The congestion and discharge soon obstruct the ventilation and drainage of the cells and absorption of the poison manifested by constitutional symptoms, as fever and malaise. Under treatment the congestion is relieved and ventilation and drainage restored with a lessening of the purulent character of the discharge and of the headache. But if the infection is allowed to continue the end result will depend upon the virulence of the infecting organism. In mild cases an immunity is soon developed and the inflammation subsides. This may be complete or with a remaining focus subject to reinfection. The severe cases completely obstruct the drainage and the infection may pass through the bony wall, causing a periostitis of the ethmoidal orbital wall. If a perforation results, orbital cellulitis, with its train of symptoms, will follow. The frontal sinus may become blocked and infected or the antrum utilized as a reservoir, and an empyema of the maxillary sinus complicates the situation.

From infancy to the grave, the membranes of the sinuses are constantly being abused, and the chronic conditions are brought about by the summation of the acute infections. In the cases where a focus of infection remains, the mucoperiosteal membrane is constantly congested, which intereferes with growth and repair and in time the bony walls of the cells become like paper and the ethmoids undergo cystic changes. There is an influence, the exact nature of which is not thoroughly understood, exerted by the endocrinal secretions. Theorizing, it may be that during the systemic stage the toxines influence the internal secretions and they in turn are deficient during the reparative stage of the inflammation, and in this way the atropic condition of the bony walls develops.

In persistent infantile ethmoids, the inflammation is not so active, but is more painful, and more likely to become chronic. The normal pneumatic structure of the ethmoids allows a greater extension of the infection, with less probability of complication and chronicity than the sclerotic ethmoid with its thick walls and small cells.

Extension of the infection to the bone will cause an acute osteomyelitis. This is more common in children than in adults and more common in the acute stage than in the chronic stage. Briefly the stages of pathology of the ethmoids are: (a) acute, either catarrhal or purulent; (b) chronic, usually purulent; (c) atrophic, and cystic; (d) hyperplastic. The difference in the last 2 appears to be due to the character of the reparative process assumed by nature in its attempt to eradicate the disease.

The sphenoidal sinus differs in its behavior towards infection due to the fact that it occupies the center of a more massive bone and is more abundantly supplied with nutrition. The acute and chronic suppurative changes occur after the same fashion, but cystic changes are never seen though the thinness of the anterior wall at times is presumption that it too undergoes paperization. Where there is a marked difference in the size of the 2 sphenoidal cavities and they are both infected, the smaller of the 2 will require a longer post-operative period to heal, or will more readily become chronic.

The anterior wall of the sphenoid springs from cancellous bone and is prone to produce excessive granulations at its base which will close in any surgical opening unless care is taken to retard it and allow the epithelium to heal over edges of the wound.

Whether polyps spring from the superficial layer and, by absorption, cause the underlying bony changes, or that the bony changes occur first and the polyps result therefrom, is a mooted question, but today the opinion is that when the polyps reform there is present pathology in the bone and the removal of their base will be necessary for a cure.

The lymphoid tissue of the pharynx and the membrane of the larynx undergo hypertrophy and congestion, due to the irritation from the discharge and as a part of nature's fight against the infection. The mouth of the eustachian tube may become obstructed and a eustachian salpingitis develop. An inflammatory hypertrophy of the subepithelial lymphoid tissue constituting the lateral pharyngeal wall and the posterior pillar of the tonsil, signifies a postnasal discharge and is convicting evidence of sinus disease.

Etiology. Age, in our experience, agrees with that of Dean, that no age is exempt, our youngest case being that of a 9 months old infant. (Case 1.) The greatest number of acute cases are seen in children from 2 to 4 years of age due to exposure at play, and again at their introduction to the infections of early school life. The older the child grows the less acute becomes the infection and the inflammation may become subacute or chronic.

Sex. In children sex seems to play but little part, but in our series of cases we have found infection more often in the female.

Season. The greatest number of cases occur during the fall and spring months. In the fall particularly, as complication of the infectious diseases; in the spring, because of the changeable weather.

Climate. A changeable climate is productive of acute infections of the sinuses. Migration to the Gulf Coast will hasten the convalescence and at times produce relief when treatment at home has failed. Cases infected in the mountains will clear up at the sea shore, and vice versa. We hesitate to advise summering in the far northern resorts for the cases that had a severe infection during the winter months, but prefer the Colorado mountains.

Social Status. In our series the children who have received proper attention are as prone to the infection as the children of the clinic, though the clinic cases suffer more complications, because of neglect.

Ventilation and Clothing. A nursery kept below a temperature of 65° predisposes to these infections. The window of the nursery should be kept closed during the inclement weather, and ventilation obtained from the rest of the house. The lay magazines have misled the public and produce too many fresh air fiends. The sleeping porch is for comfort only, and when sleeping becomes disagreeable in the open, a change should be made to the nursery. Sufficient ventilation should be provided, but the air kept warm. Too many homes, from the use of hot air furnaces, become kilns. Hot water heat is less preferable to grates, but the nuisance of the grates must give way to indirect heating.

Flannels are not advisable clothing in this climate where we often have a temperature change of many degrees in a few hours. The outer clothing should be changed to accord with conditions. The child who perspires freely has less resistance than one who may be a little cold at times. Outerclothing is preferable to too much underclothing.

Diet. A child, fed a diet beyond its sugar tolerance, is more susceptible than a child on a balanced diet to infection of the upper respiratory tract.

Diathesis. Children of the neuropathic and exudative type are prone to these infections.

Protein Sensitization. Protein sensitization has also attracted attention because of its influence in these cases. By constant stagnation of the circulation of the nasal membrane, the reparative processes are retarded and metabolic changes occur in the parts, which promote chronicity.

Internal Secretions. Internal secretions act similar to protein sensitization by their action on the circulation of the lining membrane of the nares and sinuses.

Hypertrophy of the Tonsils and Adenoids. The hypertrophied adenoid and tonsils affect the ethmoids and sphenoids in 3 ways:—(1) mechanically, by blocking the discharge from the sinuses and causing stagnation, and in turn the collected discharge irritates the adenoid and keeps it in a constant state of inflammation; (2) there is a lymphatic connection which serves to spread an infection from the lymphoid tissue of Waldeyer's ring to the sinuses, and (3) by direct extension of the inflammation.

Diseases. Influenza appears to have a predilection for infecting the ethmoids, the sphenoid and the sinus, and the present increase of the number of sinus diseases may be attributable to the recent epidemics. Erysipelas can be the result of an ethmoidal infection and not the cause as formerly thought. The acute exanthemata are complicated by infection of the sinuses and are the chief causes of the disease in children. Syphilis, tuberculosis and malignancy may either directly or by extension cause an infection of the sinuses.

Bacteriology. In turn all of the pathogenic bacteria have been accused of being the cause of acute infection of the upper respiratory tract, and now Foster claims a filterable virus to be the exciting cause of the acute cases. This confusion of knowledge is the reason for the failure of vaccine therapy receiving a better welcome. But whatever was the active organism of the late influenza epidemic, it seemed to be very potent in activating an infection in the sinuses. Cultures from the acute cases vary from day to day and those obtained in the chronic cases may be from a secondary infection.

Clinical History. The patient seldom gives as the chief complaint a symptom which is a direct accusation of the sinuses, hence these cases come more often to the pediatrician and the practitioner than to the rhinologist because the discharge descends from the posterior nares into the nasopharynx and down into the larynx. The patient's attention is centered upon these regions and he complains of a clearing of the throat, an irritable pharynx or a productive cough, with or without hoarseness. If there is a marked hypertrophy of the ethmoids or the turbinates, the blockage of the nasal ventilation will be the principal symptom. In these cases the history often obtained is of sneezing, particularly in the morning and at intervals during the day, accompanied by nasal discharge. White, of Boston, has attracted our attention to seeking a cause in the ethmoids for progressive loss of vision. (Case 2.) Likewise we are constantly meeting cases of progressive deafness, which have as their cause an infection of the sinuses and whether the aural condition is due to extension of the infection through the tube or by the action of the toxins on the eighth cranial nerve, is difficult to decide.

When the sinuses are acting as foci of infection, the patient may complain of many and varied symptoms. This is best exemplified by the arthritis of children as admirably pointed out by Dean and his colleagues.

Kidney Infections. In children the kidneys are the greatest sufferers where the ethmoids are acting as a focus of infection. Two distinct types are shown: (a) Pyelitis: This condition in its aggravated form does not improve until all foci of infection are eliminated. (Case 3.) (b) Acute hemorrhagic nephritis some time with and some time without a pyelitis. This condition often resists treatment even after the tonsils and adenoids are removed because of the ethmoidal condition. (Case 4.)

In all of these kidney cases, we have found diet and medication of no avail while the infection is active.

Pulmonary Symptoms. The West is full of patients who have been urged to seek a better climate before their pulmonary condition advances beyond repair. They had sought a relief from a cough that was productive upon arising in the morning, loss of ambition, increasing lassitude and an afternoon elevation of temperature of a degree or so. This train of symptoms attracted the attention of the diagnostician towards their chests, and he, failing to find any definite pathological physical signs, had their lungs radiographed with the usual findings—"peribronchial thickening, mediastinal cloudiness and a few apical scars." During all this time these cases are still having a postnasal discharge and each morning finds the discharge about the larynx, ready to be expelled. Hence the diagnostician in despair advises "go West." (Case 5.)

There are times when the cough resembles pertussis, due to the spasmodic contraction of the larynx from the postnasal drippings. At night these children suffer from an inability to breathe and their rest is broken by their dyspnea.

Ethmoid infections are responsible for many of the asthmas seen in children and these will not clear up until the infection is relieved. (Case 6.)

Headache. In older children a headache is often the chief complaint. The typical headache of sphenoidal sinusitis is in the suboccipital region or the center of the head, radiating to the surface at the vertex. The anterior ethmoids will cause a headache through the temples and over the eyes with pain on using the adductor muscles of the eyes. The posterior ethmoids, by their influence on Meckel's ganglion, may cause pain in the various distributions of the ganglion, but the most noticeable point is 2 inches posterior to the external auditory canal. (Sluder.)

There is a depression of the cerebration in these cases and the memory suffers, concentration is difficult, but all can be relieved by the removal of the cause.

Diagnosis. The diagnosis of sinusitis requires a careful history through physical examination of the nares, trans-illumination, suction and a legible radiogram. Unfortunately many of these cases are wrongfully diagnosed and treated symptomaticaly because a complete rhinological examination is not requested. Often the tonsils and adenoids are removed, but no after-treatment is directed against the infection in the sinuses.

Prognosis. A guarded prognosis must be given in all these cases. The majority of the acute cases will subside with treatment and a favorable climate change will hasten the convalescence of many of the subacute cases. But once a case becomes chronic, the development of the sinuses has been so influenced, that the most energetic treatment will apparently fail. The chronic case will tax the ingenuity and the patience of the peditrician and rhinologist. All foci of infection in the sinuses must be cleared up and ventilation and drainage reëstablished before progress can be expected.

Treatment. Rest is the most important therapeutic agent in the acute and subacute stages. A patient is always better after a good night's rest. The treatment from a pediatrical standpoint is purely symptomatic and dietary so as in every way possible to increase the resistance of the patient to the infection. The treatment from the rhinological standpoint may be palliative or operative and should be continued until infection has been thoroughly eradicated. Not all suppurative inflammations of the sinuses require operation. In fact in most of the cases removal of the tonsils and adenoid is the only operative procedure necessary. The judicial application of the suction after shrinkage of the membrane with an adrenaline cocaine solution will aid the drainage and the removal of the discharge from the nares by a saline douche will give comfort to the patient. The patient can be furnished a water suction device of the Brawley or Gray type for home use and also be taught how to irrigate the nares without danger to the ears. The headache of the acute cases will be relieved by ventilating the sinuses, and in the obstinate cases with severe headache the hyperdermatical use of pituitrin will open the way to ventilation by constriction of the vessels. If this plan is followed during the first days of the so-called influenza cases, there is less absorption of toxins and the case may assume the characteristics of the "three-day fever" malady. An oil spray of guiacol will serve well as an emollient to the washed membrane and also act as an antiphlegmatic.

Vaccine Therapy. It is our custom in obstinate cases to make an autogenous vaccine from the bacterial growth of the tonsils and discharge obtained by suction from the sinuses. Our result from this vaccine therapy has not been uniformly satisfactory. It has been of sufficient merit to recommend its use. It sometimes hastens the convalescence during the acute stage and increases the immunity.

Operation. The tonsils and adenoid should be removed when they are influencing the progress of the infection. It is a time-honored custom to wait until all acute symptoms have subsided before removing the tonsils and adenoid, but contrary to this, our experience has been that your operative indications must be governed by the individual case. In several cases our patients have grown steadily worse because of our inability to obtain sufficient drainage and ventilation, until this was obtained by the removal of the tonsils and adenoid. This procedure was adopted even though the case showed high fever and other acute manifestations. Recovery was prompt, and we have had no untoward operative results. Many cases have been temporarily improved without the sinus drainage, by removing the tonsils and adenoid. The failure to institute proper after-treatment was the reason for reinfection. We have found it necessary to operate on the ethmoids of only one of our cases, and on this girl of 6 years, we amputated the anterior end of her middle turbinates to obtain better ventilation and drainage. Dean advises puncture and irrigation of the maxillary sinuses in the obstinate cases where they are acting as foci of infection for a multiple arthritis.

SUMMARY.

1. Infection of the sinuses are more common than generally appreciated by the pediatrician and general practitioner.

2. Our best results have been obtained by promotion of ventilation and drainage by removal of the tonsils and adenoid.

3. The judicial use of suction and nasal irrigation will prevent the acute case from becoming chronic.

4. The adenoid case, returning for operation, is usually a sinus infection that has been neglected.

CASE REPORTS

CASE 1. Baby Virginia S., age 8 months, first child, normal birth, breast fed for 4 months, breast and bottle, 6 months, then broth and cereals added.

Normal weight curve. No previous disease.

Present Illness. Sudden rise of temperature to 104°, accompanied by nausea and vomiting, though stools remain normal. Mucous membrane of the throat red, tonsils acutely inflamed, mucous discharge from nose—ears red, no bulging. Few fine mucous râles over the lungs, general and distribution.

Initial Diagnosis—Influenza. Progress, nausea and vomiting stopped after 24 hours. Temperature remains high with slight remissions for 7 days. Nasal discharge much increased and tinted with blood about the fifth day. Cultures were negative. Inflammation of the ear drums subsided on the third day, no treatment necessary.

Blood Count. W.B.C., 12,400; polys., 79; small L., 19; large L, 2.

Urine. First 2 days, negative, then on the third day with many pus cells.

Treatment. Nasal suction instituted on the sixth day with a large amount of purulent discharge obtained. This discharge persisted for 3 weeks. Urine free from pus end of fourth week. After 6 months, condition of child is good, though slight cold produced signs of reinfection of mild degree.

CASE 2. Baby S. H., female, age 3 years, previous to present illness, history that of a normal, well-developed child of 3 years. Measles, chicken pox one year ago, both attacks mild.

Present Illness. Began 10 days before admission to hospital with chills and irregular temperature. Diagnosis, malaria. Quinine given intra-muscularly, with abscess formation in both buttocks. This was noticed at time of admission. Temperature 105°, remaining this way with only slight remissions for 3 weeks. There was marked impairment of vision—could distinguish light, but not individuals. Marked discharge from nares, tonsils engorged and red, ear drums pink, both optic nerves very white, pupils normal in size, otherwise negative. Urine, large amount of pus cells. Blood: W.B.C., 30,000. Marked increase in polys.

Diagnosis. Probably starting point, influenza, complicated by sinus infection and pyelitis. Some discussion as to whether impaired vision was due to quinine or secondary to sinus infection.

Treatment. Suction instituted. Autogenous vaccine made from discharge of sinuses given 3 days interval. Alkaline treatment for pyelitis. After 5 months, child is normal in every respect. Vision cleared up entirely, and the promptness with which the impairment of vision disappeared when the treatment for sinus infection was instituted favors the diagnosis of sinus infection.

CASE 3. Baby R., female, age 18 months, breast and condensed milk with small amounts of food up to present time. Admitted to hospital, temperature 104°, throat red, tonsils very much enlarged, mucous membrane of mouth congested, gums bleeding on slightest irritation. Glands of neck enlarged, chest negative, abdomen negative, child pale, musculature flabby, below weight for a child of this age. Blood: W.B.C., 16,000; increase in polys, 80 per cent.

Child put on balanced ration with addition of orange juice. Infection of tonsils cleared up in 2 days. Bleeding of gums and mouth subsided rapidly, temperature dropped to normal and remained so for 48 hours. Rapid rise of temperature, throat symptoms normal, but a thick purulent discharge came from the nose. Child had some difficulty in breathing. Temperature remaining high, again going to normal. The urine through the entire acuteness showed a heavy trace of albumen and many pus cells.

Treatment. Alkaline treatment for the kidneys, tonsils and adenoid removed, suction instituted after a few days. Autogenous vaccine made. Case now ending third week in hospital. Normal temperature, gaining in weight.

CASE 4. John B., male, age 5 years, normal child, no previous illness. First seen with coryza, acute follicular tonsillitis, membrane of ears red, no bulging, few scattered râles over chest.

Diagnosis. Influenza. Urine examination at this time normal. Under the usual treatment, child improves. Condition reported daily by phone, when on the sixth day the mother reported that the child was passing pure blood. Physical examination at this time shows red throat, enlarged cervical and sub-maxillary glands, thick purulent nasal discharge, temperature 100°, W.B.C., 22,500; urine, red, acid, albumen heavy; micro, many red blood cells.

Child became rapidly worse, with temperature rising daily. Tonsillar symptoms subsided, 24 hours urine showed signs of increased suppression. The child's condition grew rapidly worse and he only excreted about 3 ounces of urine in 24 hours.

Treatment. Tonsils and adenoid removed in spite of the grave condition of the patient. Patient began to improve within 24 hours. Suction instituted in a few days, complete recovery with normal urine within 30 days. There have been no relapses within 8 months.

CASE 5. Baby K., female, age 7 years, previous history, measles, chicken pox, and whooping-cough. General health, good until one year prior to first office examination. Chief complaint spasmodic cough, chiefly at night, so severe as to resemble a whooping-cough. Cough cleared up during the day. Constant nasal discharge. Child tires easily, lost weight, complains of headache occasionally. Urine normal; blood, W.B.C., 10,000, with only slight change in differentials.

Physical examination failed to show any definite pathological signs in the lungs though the D'Espine's was positive down to the fourth dorsal. Tonsils and adenoid had been removed previously. X-ray gave the usual interpretation of peribronchial thickening, mediastinal cloudiness, and a few apical scars. Von Pirquet slightly positive. Diagnosis at the time suspected tuberculosis.

Child went West, spending one year in the Sierra Madre Mountains of California. General health became excellent, all trouble disappeared. Returned in June with no trouble following until November when she contracted a slight cold. Symptoms as stated above again became manifest. This time the sneezing and nasal discharge led to the diagnosis of sinus infection. Since ventilation and drainage has been established all symptoms have disappeared.

CASE 6. Shelby P., age 7 years, previous history, bottle fed from birth. Digestion always subnormal, always below weight, intensely nervous, doesn't play well with other children, subject to frequent colds since infancy.

First attack of asthma occurred during fall months, at the age of 5 years. Because of the prevalence of rag weed and golden rod, his condition was attributed to these factors. Condition disappeared for time, but reappeared with increased violence later during the season when plant life could not be accused. He failed to show skin reaction to the pollens, or to any of the food allergens. The absence of these reactions and the time of the second attack caused us to look for another cause of this condition. The tonsils and adenoid had been removed before the first attack of asthma. With each attack, there seemed to be more nasal obstruction, causing the mother to state that she thought the adenoid had returned. The diagnosis of sinus infection was made.

Treatment. Ventilation and drainage was obtained by suction and shrinkage of the membrane. An autogenous vaccine was made and given. There have been one or two attacks of less severity during the treatment, but for the past 6 months, there has been no further trouble.

BIBLIOGRAPHY

1. Wright, Jonatha: A History of Laryngology and Rhinology.
2. Mullins, William: The Lymph Drainage of the Accessory Nasal Sinuses, Transactions of American Laryngological, Rhinological and Otological Society, 1919.
3. Dean, Lee Walace: Parnasal Sinus in Infants and Young Children.
4. Foster: Journal of A.M.A. lxvi, 1180 (1916), and Journal of Infectious Diseases (1917).
5. White, L.: The Diagnosis and Prognosis of Loss of Vision from Accessory Sinus Disease.. J.A.M.A. 7, 1510 (May 29, 1920).
6. Sluder, Greenfield: Headache and Eye Disorders of Nasal Origin.

RUMINATION IN INFANTS (Pediatria, Naples, Sept. 15, 1921). Pastore describes three cases of merycism in infants of only 6 days, 2 and 3 months old. She thinks that it is probably more common than generally suspected but escapes detection in very young infants. She was able to cure the tendency in the older children by giving the food a little thicker, but as this was not possible in the youngest child, the rumination has persisted. The regurgitation may be induced by the child's sucking its hand or sucking without anything in its mouth.—*Journal A. M. A.*

EVERYDAY PEDIATRICS.*

By R. M. Pollitzer, M.D.,

Pediatrician to the Roper Hospital and Professor of Diseases of Children,
Medical College of State of South Carolina,
Charleston, S. C.

In most towns, and especially in rural communities, the general practitioner attends at least 9/10 of all the sick babies and children. The specialist is seen most often only in desperate cases, or where feeding is the prime consideration. The general practitioner, who is a very busy and popular man, must have some idea of most of the varied branches of medicine and surgery. It is impossible for him to be skilled in all. Each specialty insists that he must know more each year of its particular field. It is manifestly out of the question for a medical college to graduate men who are competent to be so-called general specialists. Yet it is essential that these men, who are the back-bone of the profession, should be qualified to handle the majority of their patients in a proper manner. Were a census taken on the per cent. of cases treated by the average doctor, that of children would probably rank highest. Therefore, this man must be properly trained in the rudiments of pediatrics. Is he? Very often he is, but more often he does not take the time or trouble to carry out his teachings. After all the basis for success in medicine, leaving aside all question of personality, is a certain amount of education, medical and otherwise, a moderate degree of common sense and, particularly, the cultivation of the powers of observation.

It is not necessary nor desirable that all of us should be able to do radiography, electrocardiography, ureteral catheterization, and so on, but the man engaged in the practice of medicine should most certainly be so familiar with the commoner diseases as to know what to look for, be able to recognize the pathologic sign, and, just as important, take the time to look. To my mind, the man who fails most often, in diagnosing a pediatric disease is the one who neglects to make a thorough physical examination. So often the physician who deals also with adults is so accustomed to their story of an ailment that in the case of the child he sits back and awaits developments. This waiting for something to obtrude upon his diagnostic consciousness is not an exaggeration. From an experience of some years, I have no hesitancy in saying that aside from an examination of the urine the vast majority of diagnoses are missed because the throat and ears are not looked into. Provided the patient is properly held, a good view of the former takes less than one minute. The ears require more time and often it is necessary to call in the assistance of the otologist.

---

*From a course delivered at the Southern Pediatric Seminar, July-August, 1921.

Otitis Media. It is a great mistake to suppose that symptoms are a sufficient guide. Often there is little increase in temperature and at times pain is lacking. Dunn says that infection of the middle ear is one of the commonest affections of infancy and childhood. Many cases of socalled central pneumonia, and reflex disturbances from teething are really due to an otitis media.

Case 1. Francis B., white female, age 1 year. Seen January 12, 1921. Family history unimportant. A week ago she developed a nasal cold. High fever and a convulsion occurred today. Physical examination, chest, throat, urine, etc., negative. White blood count, 14,000. Ear examination showed a bulging right drum. This was opened and the following day a mucopurulent discharge was evident. The temperature dropped from 105° to 99°. A week later she was as well as ever, except for some pallor.

Tonsillitis is extremely common in childhood, and by no means uncommon in infancy. Aside from fever and prostration, there are no clues. Children rarely complain of sore throat, even with extensive lesions. At times the patient is extremely ill for several days, while in other cases there is but little constitutional disturbance. Occasionally there is an albuminuria. There is a growing impression, backed up by some statistics, that a considerable amount of nephritis and endocarditis are preceded by an attack of tonsillar infection. I recall a case viz:—E.C., aged 8 years, who developed a severe nephritis with convulsions which was just following tonsillitis. It seems unnecessary here to discuss the differential diagnosis of tonsillitis and diphtheria, though, of course, that is most important.

Case 2. Gertrude J., 8 months, white female. Seen November 9, 1920. Family history and past history have no bearing. Well developed baby, with 4 teeth. History of present illness—she took sick yesterday with fever and has been prostrated. Mother is sure she is teething. Physical examination—a well developed child, who looks ill. Everything negative except for tonsils, which are swollen, congested and have many small whitish soft spots of exudate. Culture negative for Klebs-Loeffler's. Urine negative. This baby was well in 4 days.

Without an examination of the throat a diagnosis would have been impossible. So simple a case is trite, and yet when a baby is seen after it has been treated with several doses of calomel, castor oil, and cocoa quinine, without an inspection of the throat, it does seem that some of us are not practicing medicine as we might.

Malaria. All those who live in the southern lowlands see malaria at times, even though not as often as we are led to believe. We treat many children for malaria just because of fever of unknown origin, when often the condition is of a different nature. On the other hand, it has been my experience that most of the cases of malaria in childhood are really missed. The manifestations of malaria are so different from the adult in early childhood and infancy that, unless aware of this, the blood examination will often be very surprising. The commonest suggestive findings, I believe, are diarrhea and vomiting, with a certain degree of cyanosis or pallor, accompanied by fever which is often continuous. I have seen many children with malaria who had only anemia, a slight digestive disturbance, and fever. These cases frequently are not recognized, and are attributed to improper feeding, teething or the hook worm.

CASE 3. Mason, D. N., white male, age 9 months. Parents well. Four other children well. Past history unimportant. Sits alone and crawls. Weight 22.5 pounds, 7 teeth. Breast fed. For the past 2 weeks he has been fretful, and feverish, no chill or convulsion. Quite pale. There has been some diarrhea. Physical examination showed a few râles in the chest. Temperature 100.5°. Urine, negative. Blood smear revealed the plasmodium. He had been treated by several physicians without any suspicion of malaria.

CASE 4. Sadie L.K., aged 2, had been suffering for 2 weeks with attacks of vomiting and diarrhea when I saw her in August, 1917. The stools contained mucus but no blood. She had fever and a slight cough. The diagnosis of colitis had been made by her physician. Her blood contained large numbers of the ring form of the aestivo-autumnal parasite. Both these cases received large doses of quinine, and recovered.

Pyelitis. So much has been written about pyelitis, or at least pyuria with constitutional symptoms, that it would seem as though we ought never to miss a case. Yet I see many masking under various false names. It is exceedingly common in infants and children, and impossible of recognition without examination of the urinary sediment. Here again the digestive apparatus is upset, and many of these cases closely resemble malaria. Inability to palpate a large, hard spleen is of little help, because in childhood, until late, the spleen is not felt in true malaria.

CASE 5. Emma G., white female, aged 2 years, 10 months, seen April 14, 1919. Family and past history have no bearings. Story of present illness—for 3 months she has been having attacks of fever with loss of appetite, malaise and abdominal pain of 3 or 4 days' duration. Treated by a physician, but no unrinalysis made. Physical examination—chest, abdomen and nervous system, negative. Spleen not felt. The skin has a marked pallor with a yellowish tint. The urine was normal by all the routine tests except that the centrifugated sediment contained some nucleated, small, round cells, many bacteria, and a rather large amount of pus, many of the pus cells being in clumps. No one could have recognized this as a pyelitis case without an examination of the urine. She was not treated by pelvic lavage but with the usual treatment of acid hexamethylenamin alternating with alkalis. She improved as to color, urine and general condition, though she had a protracted and varied course before the urine remained entirely clear.

CASE 6 Harriet K., aged 9 months, had been having attacks of fever and vomiting of several days duration for 2 months before her urine was examined and found to contain a large amount of pus. Under appropriate treatment there was a marked improvement in 2 weeks.

Diphtheria. Almost 30 years have elapsed since diphtheria antitoxin was introduced. It is an absolute specific. We know more about diphtheria than any other disease, but, even so, our mortality to-day is almost 10 per cent. Why? Because many parents still consider themselves competent to make a diagnosis, or administer home remedies for several days, without bothering as to diagnosis; and partly as a result of delayed administration of antitoxin on the part of the attending. Further, we often err in giving too small a dose and then having to repeat it, which costs precious time. The 4 considerations in the determination of dosage are severity of infection, the time that has elapsed since onset, the method of administration and, to a lesser extent, body-weight. A large dose on the first day is worth 10 times as much on the fifth. Many cases recover to-day even though improperly treated just as in the pre-antitoxin era 40 per cent. survived. The laity still have a vague fear of antitoxin, because some people die where it is not used in a sufficiently large dose or used too late; and using the *post hoc* argument they fall into error. Doctors, too, have paid entirely too much attention to the extremely rare cases of fatal anaphylaxis. Until such time as active immunization shall banish this once dreaded common disease from the civilized world, there will always be a few fatalities from it, but, if it were properly handled to-day, the death-rate would be nearer 1 per cent. than 10 per cent. The following illustrates several points:—

CASE 7. Ruth S., white female, aged 11 years. Family history has no bearing. She has always been a large, healthy girl. Aside from measles, several years ago, no past illness. Seen by me January 16, 1921. In October, 1920, on the 24th, she became slightly sick. She had a mild sore throat, and a little fever. A physician was called in the following day who confirmed the diagnosis of sore throat and ordered calomel and salts. He left orders to be called back at the end of one week, if she was not well, or the temperature went very high. A week later he was requested to return as she was still sick. He then took a culture and, it being positive, administered the next day (after receiving a positive report) 50,000 units of antitoxin. (Comments on the management of this case should be unnecessary, but I cannot refrain from pointing out that many people are erroneously of the opinion that in diphtheria there is a high temperature and much pain.) A few days afterwards, this girl developed a paralysis of the palatal and extra-ocular muscles. Following this she cried because of pain in her legs and lost the use of them. At times, the hands were numb. The condition grew steadily worse and had reached its maximum when I saw her. The physical examination showed a post-diphtheritic multiple neuritis, with some involvement of the heart, but no involvement of the kidneys. After remaining in bed for 2 months, she made a complete recovery. She failed to die, not because of a timely diagnosis and the proper treatment, but chiefly through her own anti-toxic powers.

Syphilis. No one really knows how prevalent congenital syphilis is, but the morbidity and mortality in infancy has been estimated as very high. In private practice it is not customary to do a Wassermann on all patients as a routine, and as the history is generally worthless in this respect, the diagnosis must be made by our powers of observation.

CASE 8. L.A., white female, aged 2 months. Family history—parents well, two other children well, none dead, no miscarriages, no tuberculosis or syphilis, admitted. Full term. Normal delivery. Breast fed. She was referred to me as a feeding problem. Present illness—not well since birth. Noisy obstructed breathing since yesterday. Tries to nurse often but is unable. Cries most of the time. At times the skin is said to be bluish. Unable to move hands, cries when they are handled. Her physician did not believe that she had any definite illness, but had put her on condensed milk. Physical examination—swollen, radial epiphyses, cracked dry palms, heart and lungs negative. Liver far below costal border, spleen not palpable. She did not have any real paralysis of her hands, as was thought by the family, but would not voluntarily use them, because of pain. The diagnosis of congenital syphilis was made without a Wassermann, and after having been on mercurial inunctions for 10 days she was markedly improved as to her feeding, sleeping, and the motion of the upper extremities, as well as her appearance. In March, at 11½ months, she weighed 22 pounds, had 7 teeth, could stand up, holding on, and was saying a few words.

All the preceding histories of cases which had very simple and common pediatric diseases or conditions, while very briefly abstracted from my notes, and imperfectly so, yet are intended to illustrate how very easy at times a diagnosis is, even to those of us who do not possess any extra diagnostic ability provided we examine the little patient. Ever since the time of Aristotle, scientific men have recognized that in order to arrive at any conclusions the facts in the case must be first collected.

In a spirit of fairness two comments must be made, there is no intention to reflect on the ability of the practitioner in general, but I have purposely selected instances where sins of omission and commission were brought to light. Nor would I have it thought that I myself possess any great brain power, or am guiltless of many, many errors. I do not happen, however, in this paper to be discussing my own faults. My sole purpose here is to show that while scientific medicine requires research and far more knowledge along many lines, yet to-day we are often not making use in our daily work of many of the most elementary bits of knowledge which we have already acquired.

TUBERCULOUS MENINGITIS AND INHERITED SYPHILIS (Archives de Médecine des Enfants, Paris, Sept., 1921). Hutinel and Merklen remark that when one has tuberculous meningitis, the fact that he has also inherited syphilis is comparatively unimportant for him. But it is extremely important for the attending physician. He has to guard against diagnosing tuberculous meningitis when the trouble is merely a meningeal reaction to inherited syphilis. On the other hand, he must not ascribe to the syphilis what is really a tuberculous meningitis. Lumbar puncture may be the only guide; a nearly normal fluid excludes the latter. With a purulent fluid, the predominance of polynuclears suggests acute pyogenic infection. Even when the onset and symptoms all point to tuberculous meningitis, including lymphocytosis in the spinal fluid, the disease may be thrown off finally, proving its nontuberculous nature. In fact, certainty is possible only when tubercle bacilli are found in the cerebrospinal fluid. Their article is based on twenty cases of actual tuberculous meningitis in children with inherited syphilis, and this experience warns to apply treatment as for syphilis in every case of tuberculous and other meningitis, as we never can categorically deny the possibility of unrecognized inherited syphilis. By neglecting this rule we may overlook and fail to cure some easily curable syphilitic reaction. Mercury inunctions are the main reliance. They have never ventured to give arsenicals in these dubious cases. The specific treatment has no appreciable action in true tuberculous meningitis. Children with inherited syphilis are candidates for tuberculous meningitis, and the danger is still greater with tuberculous lesions already installed elsewhere in bones, glands, etc. The nerve centers must be regarded as especially vulnerable in inherited syphilis, and they must be guarded with special care. When the children in a family die of meningitis, syphilis should be sought in the parents.—*Journal A. M. A.*

SCARLET FEVER IMMUNIZATION.

By Frank C. Neff, M.D.

Kansas City, Mo.

In the past 5 years the writer has had occasion in the therapeutic use of convalescent scarlet fever serum to inject it into exposed individuals as a prophylactic. This work was made possible through the coöperation of Doctors D. O. Smith and Watson Campbell, bacteriologists in the laboratory, by securing the serum from cases available as donors in the Isolation Department of the Kansas City General Hospital.

In determining the merits of any such procedure, it must be granted that it is difficult to determine whether well individuals have been sufficiently exposed to develop the disease or that they were actually susceptible. Some of the latter individuals may have acquired immunity in early life when the disease was so mild as not to be recognized.*

The diagnosis of doubtful cases of scarlet fever is of greatest importance not only in isolation procedures but also for the valuation of immunizing methods in contacts. When individuals, who have been in contact with a border-line case, do not contract the disease, one may be in doubt whether the case was really one of scarlet fever or whether the exposed individual is already immune naturally, or through an unrecognized attack sometime previously. It is this uncertainty that makes it sometimes difficult to draw conclusions about any method of prophylaxis. There are sporadic cases of mild sore throat with an indefinite scarlatiniform rash and a transient low elevation of temperature, and subsequent slight or no desquamation. This is the type that needs the assistance of all possible diagnostic aids. The continued presence of a moderate leucocytosis and eosinophilia adds somewhat to the probability of scarlet fever. The increased capillary permeability—Rumpel-Leede phenomenon—though present in other diseases, is of some help when combined with the foregoing symptoms. Familiarization with the phenomena appearing locally after the intradermal injection of specific and non-specific sera may prove of some diagnostic value. We have not yet had sufficient experience with this "dispersion-phenomenon"* of Schulz and Charlton (Aŭslöschungsphänomen) to judge its reliability. Neuman (Deutsch. med. Wchnschr., Berlin, 1920, XLVI, p. 566) regards it highly.

---

* Darner (Deutsch med. Wchnschr., Berlin, 1920, XLVI, p. 734) concludes that in the first few months of life infants are immune or develop such a mild case that it is insignificant.

When crossed infection with scarlet fever occurs in a hospital ward, or when the disease appears in a public asylum for children or in a household, the desirability of having a protective measure for immediate application is evident. The incidence of susceptibility to scarlet fever, as yet undetermined, makes it impracticable to consider a method of widespread immunizaton until such time as a simple, unobjectionable and efficient agent may be found.

One attack of undoubted scarlet fever produces permanent immunity as a rule. It is hard to find exceptions of a well-authenticated nature. Hutinel and Nadel (Arch. de Med. des Enf., Paris, 1921, p. 471) have noticed that recurrence or relapse during convalescence may occur if the natural immunization has been modified by some other coincident infection at the onset of the scarlet fever. Recurrences they regard as rare. Convalescent or immune serum must therefore contain antibodies sufficient for maintaining permanent immunity.

Several factors are necessary in making practicable the employment of human serum for therapeutic or immunizing purposes. First of all, one must be diligent in securing suitable donors during the period when the antibody content of the blood is at the maximum. In any community which possesses a contagious disease hospital there will be for at least part of the time cases of scarlet fever from which blood may be obtained. During the presence of an epidemic, when serum is most needed, it will be readily obtained if one takes the trouble to do so. Only well-proven cases should be selected for donors, and it is obvious that complications, such as lues and tuberculosis, make unsuitable for injection into other individuals the serum of those suffering from them. The duration of the potency of the withdrawn blood is as yet not known, hence for the present the use of as fresh a serum as obtainable is advisable. We have used some serum as old as 3 months. Finally, the assistance of a serologist is invaluable in securing, preserving and, before using, testing the sterility of the serum to be injected.

---

* Steinkopf (Ztschr. f. Kinderh., Berlin, 1921, XXXI, p. 132) obtained a positive reaction in 83.7 per cent. of 49 cases of scarlet fever. This extinction (Auslösch) phenomenon is the extinction of the rash when normal serum is injected in the skin. It is not a mere blanching, but all the evidences of the rash in the blanched area have disappeared.

For several years the laboratory of the General Hospital has seldom been without convalescent serum, which was available to those on the service, and occasionally given to physicians outside. The house staff and the laboratory officials are expected to remain on the lookout for donors and secure as much blood as is consistent for suitable convalescents to give.

As to the efficacy of convalescent scarlet fever serum as a prophylactic, little if any work has previously been done or published in this country. Park, Zingher and Weaver have done noteworthy work in calling the attention of Americans to its therapeutic value in early, severe and toxic cases. These workers have been conservative in estimating their results in a therapeutic way which have now extended over a period of several years. They recognize, as does any one who has likewise used diphtheria antitoxin, that little can be done for the disease after its severe ravages have existed for 4 or more days.

Combination of Scales and Convalescent Serum. Several Italian workers, among them, Caronia (Pediatria, Naples, 1918, XXVI, p. 406), first used scales from which an antigen was prepared which seemed able to produce permanent immunity. The vaccine was prepared by soaking the scales in serum from convalescents which dissolves out the antibodies. Injected subcutaneously, it produces a specific amboceptor for the alcoholic extract of the scales.

Di Cristina (Pediatria, Naples, 1916, XXIV, p. 385) prepared a vacine with 15 c.c. of convalescent serum and 10 gm. of desquamated scales, adding 8 per cent. phenol and 1 c.c. guinea pig complement, and incubating for 15 minutes at body temperature. The serum was centrifuged and put in vials and sealed up. One-tenth cubic centimeter of this was used each second day. By the third injection there was a specific deviation of complement. Children then exposed did not contract the disease.

Rutelli and Di Cristina, in the Palermo, Italy, Children's Clinic have had marked success with the injection of convalescent serum in which an extract of the scales was added to the serum. By this method they state that epidemics of scarlet fever, varicella and measles in their hospitals have been eradicated.

Di Cristina (Pediatria, Naples, 1918, XXVI, p. 406) used the foregoing method in the Naples Pediatric Clinic and prevented 23 children from developing the disease. No provision for isolation exists in their clinic and these children were exposed during the whole period of the outbreak of the scarlet fever.

Di Cristina (Pediatria, Naples, 1919, XXVII, p. 1) confirms his previous experience of the value of the serovaccine, and reports that 40 children, made immune in this way, stayed in the same room and slept in the same beds with scarlet fever patients and none developed the disease. In private families his experience has been the same.

Use of Convalescent Serum Alone. There have been only 2 reports, and these from Germany and Japan, in which convalescent serum alone was used. Degkwitz (Ztschr. f. Kinderh., Berlin, May, 1920, p. 134) reported encouraging results in the prevention of the disease. He used 5 or 6 c.c. of the scarlet fever convalescent serum. Takahashi (Japan Med. World, Tokio, 1921, 1, No. 2, p. 4) had the temerity to inject his own 5 children with a minute portion of blood obtained from a scarlet fever patient on the sixth day of the disease. There was no reaction. A larger amount of blood from a similar patient was injected into his own children 50 days later, without development of the disease. He believes that immunity was established in this manner. This assumption would probably not be granted by Dick of Chicago at the John McCormick Institute for Infectious Disease (J.A.M.A., Sept. 3, 1921, Vol. 77, No. 10, p. 782), who injected serum and whole blood from early scarlet fever into 11 volunteers, none of whom had any local or general reaction following. He does not mention whether these volunteers had ever had scarlet fever.

Campbell's Technic for Collecting the Blood and Preparing the Serum for Immunization Against Scarlet Fever. The ordinary flat pint whiskey bottle has been found very satisfactory as a container for collecting the blood. The thin clot in a flat container gives a better yield of serum than a thick, bulky one. The bottle is rinsed out with normal salt and the whole apparatus is thoroughly autoclaved. The blood is usually taken from the median basilic vein. The tourniquet is applied just tight enough to obstruct the venous flow, but not enough to interfere with the arterial circulation. The needle is inserted into the vein against the flow of blood. Then a slight vacuum is produced in the bottle, enough to keep the blood flowing freely. Usually the bottle can be filled without difficulty. The bottle is immediately put in an incubator or water bath at 37½° C. for 3 or 4 hours, then put in icebox 24 to 36 hours, then the serum is pipetted off and put into convenient size containers usually about 50 c.c. to the container. Two-tenths of 1 per cent. tricreosol is added as a preservative. The serum then is inactivated at 56° C. for 30 minutes and stored in icebox ready for administration.

Our experience at the General Hospital and in private practice has been entirely favorable. No case of scarlet fever has developed among those given convalescent serum. We have used a single dose of 15 to 30 c.c. Probably the smaller dose is sufficient and repeated in 24 hours if the exposure is continuous.

Two instances in our experience are of especial interest:

One child in a family of 4 children had typical scarlet fever. Another child in this family developed a severe angina and vomiting. Within a few hours of the recognition of these evident prodromal symptoms, convalescent serum was injected. No rash appeared. There was no effect upon the course of the angina and later cervical adenitis. The remaining 2 children injected developed no symptoms whatever.

Two children bedfast with influenza were waited upon by their father, who was even then broken out with typical scarlet fever. These children received a dose of convalescent serum, likewise the nurse and the maid, none of whom had ever had the disease, nor ever before been near it. No infection with scarlet fever appeared. We were apprehensive that these children, who would be expected to have a lowered resistance from the influenza, might fail to develop an immunity.

CONCLUSIONS.

Our list of contacts who might have been expected to develop the disease, and who were given a prophylactic dose has been small, due to the fact that in this period we have had no epidemic in Kansas City. Thus far we have used the method in 25 well exposed contacts with no failure nor untoward result.

Because of the short incubation period of scarlet fever, we would recommend for immunization the use of convalescent serum at the earliest moment after exposure.

We will need a larger experience with the method before drawing conclusions as to its certainty. Safeguarded as we have used it, we shall continue with it and hope that others may try it and report results.

THE BREAST FED PELLAGRIN: RELATION TO THE AVITAMINOSES.

By Sam R. Lustberg, M.D., and J. A. K. Birchett, Jr., M.D.*

Vicksburg, Miss.

An abundance of literature is fast accumulating on the subjects of vitamines and avitaminoses. Still they are live topics of the day, and probably will remain so until their identities are determined. Infantile pellagra is here studied in relation to the unknown "food accessory."

The usual infantile pellagrin has a related history of poor growth, frailness, restlessness, attacks of diarrhea, sore mouth, and symmetrical skin eruptions on the hands or feet or both. The cases were all mild in nature, and ranged in ages from 5 to 10 months. They were strictly breast fed, and in each instance the mother was a pellagrin.

We naturally ask, how did the infants acquire the disease? Was it a specific infection and therefore contagious? The mothers had the disease, and were feeding their off-spring on their milk. Was there anything about this breast milk diet that led to pellagra?

1. *Specific Infectious Theory.* Back in 1913-14 there were various commissions studying pelagra in the South. Siler, Garrison and MacNeal[1] made a study of the progress report of the Thompson-McFadden Commission, whose studies were published in the American Journal of Medical Sciences, April to September, 1913. They found evidence to support a specific infectious disease, and summarized by saying "that in a certain 6 villages new cases of pellagra originated almost exclusively in a house in which a pre-existing pellagrin was living, or next door to such a house, suggesting that the disease was spread from old cases as centers." Here in our own institution however, where we treat more than 50 pellagrins (men, women and children) a year, with no segregation, there has never been a case developed among the other patients or among the hospital help. The work of Goldberger[2] on transmission of pellagra to the human subject covers an interesting chapter, and should leave no remnant of doubt in the percep-

---

*From the children's ward of The Mississippi State Charity Hospital.

tive mind as to the elimination of pellagra being due to a specific infection. His work and experiments were enlightening and opened channels that led to further research and another explanation as to the cause of pellagra.

2. *Diet.* The character of the diet can undoubtedly influence that store of all types of known vitamines in the body,[3] and this is of pronounced significance for the nursing mother in determining a beneficial or baneful effect on her milk through her diet. According to the mother pellagrins' statement, they bought dried peas, dried beans, musty corn meal, sugar, salted hog meat, rice, coffee, canned milk, molasses, lard, and a few other minor articles of diet from the village grocer. They very seldom had vegetables and when they did it was potatoes, greens and turnips, and none in the winter, and an increasing quantity toward summer, but at no time a large quantity, and at intervals far between. Lean meat was sparsely used, the potatoes mentioned above were cooked with lard, also the greens and turnips were boiled with fat salt pork. The bread of their diet was home made, no bakers bread being available, and was made either of flour or corn meal mixed in the frying pan with the grease or "gravy" which always remained after the fat, salty pork had been fried. This bread is known among the negroes as "shortening bread," when mixed with flour, and cornbread, when made with corn meal.

Pellagra takes 3 months to develop. It follows the winter season, and it is during these cold months that the mother is becoming a candidate for pellagra because she is indulging in a pellagrin's diet.[4] She is eating a diet (above mentioned) lacking certain foodstuffs (proteins), excess of others (fat, carbohydrates), and shown to be poor in some or all of the vitamines, such as dried peas, dried beans[5], corn meal[6], lard,[7] salty hog meat[8], and canned evaporated milk.[5] Thus we see that the mother pellagrins are subsisting on an unbalanced diet deficient in vitamines. They had little or no vegetables, and therefore did not get the benefit of the vitamines of the plant kingdom, for it is agreed among the greater number of investigators, that animals in general are dependent on the plant kingdom for all of the recognized groups of vitamines.

We were fortunate enough to have come under our observation 3 female pellagrins, who brought to the hospital with them their infants, not because of being sick, but as there was no one at home to care for them. We became interested in these infants, due to the fact that they did not appear to be healthy individuals. These cases of infantile pellagra were carefully studied and we noted with certainty that the breast fed child of a pellagrin would be a healthy individual, if given any accessory as soup, cow's milk, zwieback, and fruit juices. When no accessory article of diet was added, the infant was poorly developed, cried a great deal, and presented the tongue and skin findings of pellagra. Mothers' pellagrin milk was analyzed, and found to contain the proper proportions of fat, carbohydrate and protein; but the mothers' diet was poor in protein, high in hog fat and rich in corn meal carbohydrate. A wet nurse was substituted, whose milk analysis was similar to the pellagrins; still our pellagrin child soon recovered. In another case, we substituted a wet nurse and besides gave one artificial feeding of cow's milk, and fruit juices, and the recovery was speedier. This evidence seems to show that breast fed infantile pellagra is due to a primary unbalanced diet (which means unbalanced vitamines) consumed by the mother pellagrin.

Therapy. The breast fed infantile pellagrins, as a rule, develop the disease in only a mild form, and respond to dietic treatment. They are removed from the breast and placed upon artificial feedings, such as cow's milk, fruit juices, purees, vegetables and albumin milk (severe cases). This new diet is a sound, complex one, one that is balanced in its foodstuff, containing the vitamines in full force.

CONCLUSIONS.

1. The specific infectious theory as the causation of breast fed pellagra is eliminated. Treating over 50 cases (men, women and children) a year in this institution, with no segregation, there has never been a case developed among the other patients or among the hospital help.

2. The manifestations of the disease, in both mother and child, present themselves in the spring and summer.

3. A dietary error shown to be pre-pellagrous was prevalent in the winter diet of the mother.

4. A pre-pellagrous diet (dried beans, dried peas, corn meal, lard, canned, evaporated milk), contains an excess of fat and carbohydrate, and lacks proteins. This diet is unbalanced; it has

excess foodstuffs shown to be poor in vitamines; it has not the proteins, a foodstuff shown to be rich in vitamines. The character of this diet undoubtedly influences a baneful effect on mothers' milk, and therefore the suckling infant shares in the deficiencies.

5. Curative results were obtained by placing the infant on artificial food (cow's milk, fruit juices, vegetables, zwieback and purees). In this new ration, we find a well balanced diet and vitamines in *full-force*.

REFERENCES.

1. Siler, J. F., Garrison, P. E. and MacNeal, W. J.: Further Studies of the Thompson-MacFadden Pellagra Commission; A summary of the second progress report. J. A. M. A. 63: 1090 (September 26, 1914).
2. Goldberger, J.: The Transmissibility of Pellagra; Experimental Attempts at Transmission to the Human Subject. South. M. J., 10: 277, 1917.
3. The Storage of Vitamines in the Body. Editorial, J. A. M. A. 76: 1335 (May 14, 1921).
4. Lustberg, S. R., and Birchett, Jr. J. A. K.: Pellagra; A Further Contribution to the Avitaminoses. To be published soon. 1922.
5. Funk, C. & Dubin, H. E.: The Vitamines, Williams & Wilkins Co., 1922.
6. McCollum, Simmonds & Pitz: Dietary Deficiencies of the Maize Kernel. J. Biol. Chem. 28: 153, 1916.
7. Drummand, J. C., Golding, J., Zilva, S. S., and Coward, K. H.: The Nutritive Value of Lard. Biochem. J. 14: 742 (December, 1920).
8. McCollum, E. V., and Davis, M.: The Necessity of Certain Lipins in the Diet During Growth. J. Biol. Chem. 15: 167, 1913.

Abnormal Forms of Diphtheria (Bulletin Médical, March 26, 1921). Darré discusses the simple catarrhal form of sore throat, without membranes, but for which the diphtheria bacilli are responsible; every sore throat is suspicious when diphtheria is epidemic. Another perplexing form is when the diphtheria attacks adenoids first. The extreme pallor, small pulse and other signs of severe intoxication should give the alarm, for the diphtheria toxin is absorbed with extraordinary rapidity from adenoiditis. Another type described simulates follicular tonsillitis or there may be a form suggesting herpes. The most deceptive form is when the violent pain in the neck, trismus and the aspect of the pharynx suggest a phlegmon around the tonsil.—*Journal A. M. A.*

MEDICATION IN INFANCY AND CHILDHOOD

By James D. Love, M.D.

Jacksonville, Fla.

During the past 2 decades, the pediatrician has greatly neglected the science of pharmaco-therapy. He is aware that the natural tendency of the sick child is toward recovery, that most of the diseases of children are related to disorders of digestion and nutrition, and that medication of necessity must play a secondary rôle to proper feeding. A visit to the pediatric clinic of any of our most reputable institutions will convince any one of the truth of Barker's statement that "our teaching hospitals at present are more diagnostic institutes than institutes of therapy." In these clinics, every feature of the disease under consideration is exhaustively discussed till the question of therapy has been reached. Were it not tragic, it would be amusing to note the manner in which the learned clinician dismisses the subject of therapy as belonging to a domain unworthy his consideration. We know of nothing more dampening to the ardor of the seeker for therapeutic knowledge than a visit to the out-patient department of the average pediatric clinic, and until a complete readjustment of the methods now in vogue has been effected, till pharmaco-therapy means something more than the doling out of drugs according to a few absurd and antiquated formularies, the out-patient clinic of our hospitals should be removed as far as possible from the teaching department of pharmaco-therapy. It is not remarkable that the average student of medicine becomes imbued with the mistaken dictum that "diagnosis is the one essential and anyone can treat a disease once a diagnosis has been made." With a host of new and valuable drugs at our command, and older drugs better standardized than ever before, with striking advances in our knowledge of applied physiology and rational therapy, medication should be a more definite and exact art than at any time in the history of medicine.

Many of us take as things for granted the good effects of drug medication and allow our disappointments to render us skeptical, if not indeed nihilistic. Too many of us fail to recognize the limitations of drug therapy and many more of us fail to recognize our own limitations, and our own errors in the selection, dosage and administration of drugs. It is a hopeful sign of the modern trend of medical thought that such moulders of medical opinion as Barker, Christian, McCruden, Helmholz, Richard Smith and others have not only recognized the general skepticism among medical men concerning drug medication, but are lending their influence to counteract a mistaken tendency.

Children lend themselves more readily to drug medication than do adults since, for the most part, but one organ is markedly involved and a qualitative diagnosis is not so essential; and since most often the disturbances of children are functional rather than organic. Their physical organism is unimpaired by the ravages of previous disease, excesses and prolonged medication; being less imaginative and less neurotic than adults, they neither magnify nor minimize the effects of drug medication, thus rendering possible accurate interpretation of results. Pediatricians then, more than the followers of any other branch of medicine, should become both apostles and teachers of pharmaco-therapy. But too often the pediatrician, absorbed in the problem of adjusting a dietary to a child suffering from an evident nutritional disturbance, becomes indifferent to the assistance at his disposal from the judicious employment of drugs. The mere fact that the proper correction of a dietary error is the chief desideratum constitutes no valid excuse for his failure to utilize drugs that may relieve distressing symptoms and improve the function of digestion and assimilation. If a feeding case can be made more comfortable and the duration of the illness shortened by the temporary employment of laxatives, carminatives and stomachic tonics, by drugs that mitigate suffering, by sedatives that furnish a needed rest and restore the lost balance to a disturbed nervous equilibrium, we see no reason for their being withheld even though the remedies employed belong exclusively to the domain of symptomatic pharmaco-therapy.

If an increased knowledge of applied physiology and rational therapy has encouraged us in the scientific employment of drugs, it has also taught us something of the dangers attendant on overmedication, the folly of prescribing indiscriminate mixtures and the too frequent administration of drugs without sufficient indication. The abuse of drugs is by no means confined to the pediatrician, nor is it in any way sectional. Southern physicians have been widely criticized, and without doubt justly so, for the abuse of 2 drugs. in particular, calomel and quinine. Some of our critics from the North are evidently unaware that calomel has a wider sphere of usefulness and is more often indicated in the South than in other sections of the country. Southern people, southern children included, are, without good reason, more addicted to the eating of fat foods than people of the North and West. This, in connection with the recognized fact that fats are badly borne during hot weather, accounts for the so-called bilious conditions to which southern children are especially prone. The fact that calomel has a selective action on the duodenum, which part of the alimentary canal is especially vulnerable to a combination of hot weather and rich foods, renders calomel a remedy of undoubted utility in the treatment of one of the most prevalent conditions confronting the southern pediatrician. In spite of its nauseating qualities, no drug has been found that can be regarded a fit substitute for calomel, and a measure of the criticism aimed at southern physicians for the abuse of calomel is unfounded.

Quinine has been even more abused; and we can, without exaggeration, state that 90 per cent. of the cases of fever of obscure causation, occuring in children of the South, are treated at one time or another with quinine. This despite the fact that quinine has a comparatively limited sphere of usefulness in conditions other than malaria, and in spite of the fact that malaria has become a comparatively rare disease in most sections of the South. Our northern colleagues are possibly unaware of this latter fact, and all too frequently, when treating children from the South, jump to the conclusion that malaria is the disease to be combated, and through the uncalled-for use of quinine subject themselves to the same indictment we have drawn against southern physicians.

The greatest death toll exacted of children for the abuse of drugs is in connection with the use of opium in the management of infectious diarrheas, and when physicians in general realize the dangers attendant on the routine employment of opium in the treatment of diarrheas and respiratory disorders of children, then will opium be assigned a position in the list of useful drugs to which it is entitled.

In the writer's opinion, one of the most pernicious practices now in vogue is the very frequent administration of pluriglandular substances for the many diverse and obscure nervous disorders of sick children. Mixed glandular products are given without stint for almost every affection of the nervous and muscular system, no matter what may be the pathology. They are given for developmental defects as well as conditions having their origin in birth trauma. The mongol is fed them almost *ad libitum* and they become a part of the daily menu of children with every grade of physical infirmity, mental deficiency and idiocy. While in the writer's opinion little or no good accrues from the practice of this modern example of polypharmacy, yet, even should improvement follow, it is obviously impossible after the employment of a hodgepodge of glandular extracts to more than vaguely surmise as to what definite agency the improvement was attributable. Some of the substances used are possibly antagonistic to others, some synergistic, while others are absolutely inert. Certainly the use of such unscientific medleys of unknown drugs for equally unknown conditions can be attended with no results that add to our knowledge of therapeutics or increase our confidence in endocrinology. These criticisms apply equally to the employment of mixed vaccines for almost every affection incident to childhood. The writer is not blinded to the good that is being accomplished through the intelligent administration of vaccines, nor to the probability that they will in the future become agencies for even greater accomplishment. We deplore the routine use of mixed vaccines on the ground that in most cases the results are negligible, and in no case can results be confidently attributed to any definite agent. Unless positively indicated, the good results following the use of vaccines are not commensurate with the pain inflicted on the little sufferer, nor do their use compensate for the dread and horror of the doctor thus invariably inspired.

It is to be regretted that the average physician, no matter how honest his intentions, has never been capable of passing correct judgment on his own therapeutic endeavors. In his eagerness for good results, he too often finds a response to his efforts which can only be accounted for through his optimistic and hopeful disposition. His prejudice in favor of or against certain measures blinds him to his failures, and inspires him with assurance unwarranted by his actual results. This prejudice, perhaps a natural one, renders the "intelligent clinical observation" of Barker a quality as rare as it is desirable; for human reason, ever the servant of prejudice, finds a way to justify us in every course of procedure. So the honest physician of the past, no matter how misled by ignorance and superstition, no matter how blindly he adhered to false doctrines, creeds and cults, was as positive as to the potency of his methods as the rational therapeutist of today.

Though it is true that "results in clinical experience must ever remain the final and crucial test of every form of therapy," it is equally true that physicians need more guidance in the direction of both rational and empiric therapeutics than they are now receiving. It is only through close coöperation between our research laboratories and the clinical and teaching departments of our hospitals, through reliable information concerning the potency, physiological action and indication for drugs, based on laboratory experimentation and observation in hospitals by unprejudiced clinicians, that the art of pharmaco-therapy will be advanced.

Finally, in our teaching hospitals and medical schools, a separate chair must be created for the teaching of pharmaco-therapy. A position worthy of its practical importance must be assigned it in the general curriculum, and it should be made obligatory that third and fourth year students pursue this special study.

STENOSIS OF THE PYLORUS IN INFANTS (Nourisson, Paris, July, 1921). P. Rohmer describes three cases of stenosis with hypertrophy of the pylorus and extreme dilation of the stomach. In 265 cases on record, the dilation was marked in 10 per cent. Aerophagia is a contributing factor, and lavage of the stomach is of great benefit. The prognosis does not seem to be any graver with the dilation than without. In two of his three cases the motor function of the stomach seemed normal several months after prolonged course of daily lavage of the fasting stomach. The third infant succumbed to an intercurrent infection at the age of 4 months.—*Journal A. M. A.*

THE SOUTHERN PEDIATRIC SEMINAR.

An Experiment in Pediatric Teaching.

By Frank Howard Richardson, M.D.
Children's Diagnostic and Nutritional Clinic,
Black Mountain, N. C.

During the winter of 1920-21, a very interesting correspondence sprang up among a group of pediatrists of the eastern portion of that large section of the country known as "the South." This correspondence represented the definite taking shape of an idea that had existed in rather nebulous form for a long time,—an idea that was the resultant of the following postulates:

1. That the vast majority of sick children never come into contact with the pediatrist, but are treated from birth to adulthood by the family practitioner. If this is true of sick children, how much more is it the case with well youngsters?

2. That the character of treatment meted out to children lags sadly behind the best present-day knowledge of pediatrics.

3. That many general practitioners would be glad to learn more about such an important fraction of their clientele as is constituted by children, if they could do so without too great a sacrifice of time, money, and strength.

4. That preventive medicine, however difficult to apply in adult practice, must surely constitute a large part of practice among children, if the profession of medicine is to justify its existence.

If all the above are true (and to which one of them can exception reasonably be taken?), then there should certainly be available vacation centers all over the country to which men might go for brief review courses in the prevention and treatment of the diseases of children, and at the same time get some of the rest and recreation to which 50 weeks of strenuous practice would seem to entitle them.

As a result of this correspondence, it was determined to write to some 30 men in all, inviting their cooperation in the launching of a Southern Pediatric Seminar the ensuing summer. Those invited were of 2 classes: (a) pediatrists resident in this region; and (b) men engaged in specialties with which some slight bowing acquaintance would seem to be essential on the part of anyone dealing with children, namely, orthopedics, ophthalmology, ear-nose-and-throat, dentistry, and clinical pathology. The letters and the responses elicited are well worth studying and analyzing, especially by those who may be encouraged by the success of this venture to engage in creating similar centers in other parts of the country. The invitations contained what could by no stretch of the imagination be called a flattering financial proposition, namely, that the recipient leave his practise, at the busiest season of the year, without salary and at his own expense, and give a series of lectures or clinics, or both, on some phase of pediatrics. The only inducement offered was the opportunity of working for what the chairman of the Pediatric Section of the Southern Medical Association had adopted as a slogan,—"Better Pediatrics for the South!"

The response met with was almost overwhelming. With the exception of 2 men, who did not respond at all, and 2 more, who were unable to come because of previous engagements, every man invited accepted,—many of them enthusiastically,—and agreed to come for as long a time as he could spare, and to do whatever was asked of him to the best of his ability. Such an overwhelmingly favorable response seemed to indicate that a real need must exist, which men felt that such an effort would fill, and seemed to constitute a "mandate," if anything possibly could do so, for the creation of a Southern Pediatric Seminar.

There seemed to be 5 definite requirements which must be met, if the piece of work to be done was to be done successfully:

1. It must be possible for a man to accept an invitation to teach, without too great a sacrifice of time. For not only was no remuneration to be offered, but not even transportation or maintenance was to be provided. It was therefore necessary that the work be so distributed among many men, that each could reduce to a minimum the actual time lost from his work at home.

2. On the other hand, however, there must be definite, well-thought-out courses given, covering the different phases of the subject with some attempt at completeness, as distinguished from a mere series of unrelated single papers by different authors, no matter how excellently written nor by what eminent men. Such a program, as the latter, would have been but a repetition or duplica-

tion of the work of the Pediatric Sections of the Southern Medical Association or of the State Medical Association,—ground already well covered. What was wanted was a real review course in the various departments of medicine, as they bear upon the general practitioner in his relationship to the child.

3. If the course was to be of real service to the man for whom it was intended, it must be short enough for him to be able to complete, even in the short vacation many physicians allow themselves. Two weeks was taken, not as an optimum, but as a minimum of time in which to bring up for consideration even the briefest phases of the most important subjects deemed essential.

4. If it was to be a vacation course, it must be given in the summer time.

5. If it was to constitute a real combination of work with play for the tired practitioner, it would seem as if the hot city, the so-called "medical center," must be avoided; and yet there must be clinical material in sufficient quantity and of sufficient variety to point the morals and adorn the tales of the didactic clinics.

Points 1 and 2 were met by inviting the coöperation of a considerably larger group of men than would have been necessary, or even desirable, had the course been given in a medical center large enough to have furnished a resident teaching staff. A résumé of the personnel will show this at a glance, and also indicate the representative character of the group. There were: fifteen pediatrists, from the 5 Southern Atlantic States; one professor of pathology, from one of the Southern medical colleges; one obstetrician; one surgeon; one secretary of a State Board of Health; one director of School Hygiene; one health officer detailed for this work by the Surgeon General of the U.S.P.H.S.; two editors of medical journals; one orthopedist; one roëntgenologist; one laryngologist; one psychiatrist.

No man but the pathologist was asked to give a course consuming more than 4 days. These men attended, many from a considerable distance and at no little personal sacrifice and expense, in order to "make the thing go," and as their contribution to "Better Babies in the South!"

Points 3 and 4 were met by choosing the last week in July and the first week in August.

Point 5 seemed ideally met by choosing a center in mountainous western North Carolina, "the land of the sky!" The small city of Asheville, a year round climatic health resort, is for this very reason remarkably cosmopolitan, and boasts a medical faculty of a size and calibre that many a much larger city might envy. Its varied hospitals and sanatoria (government, municipal and private), offer a wealth of clinical material for illustrating the specialties. Less than a score of miles in either direction is a summer health center for children. One of these has for a nucleus one of the few summer children's sanatoria in existence. The other clusters round a summer diagnostic group interested in children exclusively, well as well as sick, with nutrition classes and school welfare work as material to demonstrate preventive pediatric procedures. The fact that this region (known in the North largely as a winter resort, catering especially to adults), is to a far greater extent a summer resort for the whole South, to which children especially are brought for relief and change from the enervating heat of the low country, makes it especially appropriate for such a center as has been established. The summer climate at the altitude of these 3 places, averaging around 3,000 feet, is not unlike that of the mountainous parts of New England, without the chilly nights of the mountains further North. In fact, Mount Mitchell, a few miles away, and Mount Washington, in New Hampshire, are the 2 points of greatest altitude east of the Rockies.

As to the character of the course itself, the larger portion of the time was devoted to medical pediatrics and feeding, in courses consisting of 4 one-hour lectures and demonstration clinics, each course given by a different pediatrist, and covering a different phase of the work. In the feeding work, emphasis was laid upon the main principles underlying the simplest known method of infant feeding, with the alimentation of the healthy normal child taken up before that of the sick baby. All artificial feeding, however, was taught as of secondary importance, in comparison with the technic of the management and maintenance of breast feeding, with its corollary—complementary feeding. The preventive work stressed the importance of the preventive inoculations (diphtheria, smallpox, and typhoid); of mental hygiene; of nutrition class work, with its methods; and of the complete examination of children. The important outstanding points of the associated specialties, in their relation to pediatrics, were brought out in two-period courses given by the respective specialists. The afternoons afforded the longer periods necessary for satisfactory laboratory work.

The results of the first season's work have been more than encouraging. The first inquiry was received from a distant part of Louisiana; and later letters asking about the course came in from all parts of the South. In spite of the unprecedented financial stringency throughout the South, the attendance was most encouraging for a first year's session. A faculty organization was created, with the chairman of the Pediatric Section of the Southern Medical Association (who happened to be as well the vice-chairman of the Section on Diseases of Children of the American Medical Association) as dean; a permanent registrar; and a steering committee, to act, *ad interim,* in arranging for the next year's session. The judgment was unanimously expressed that a real need was in a fair way of being met; and on this basis the teaching body all pledged themselves to repeat the work the following year, improved and intensified as experience indicated it should be. An unusually valuable loan library of pediatric literature was made available for teachers and students. And, best of all, a series of courses was given which, for clearness, simplicity, and helpfulness for everyday practice among children, it would be hard to duplicate at any institution in the land. These courses constituted a summary of the newest, as well as of the oldest and best, pediatric theory and practice available to-day. As such, they could not fail to have an influence upon the character and the caliber of treatment available to the children in the section where they were given. When the universities and medical colleges are willing to face their responsibilities in this regard, and adequately assume the burden of further instructing the full-fledged practitioner in the progress of this most important part of his art, the Southern Pediatric Seminar holds itself ready to give its task over into their more capable hands.

A PORTABLE INCUBATOR.

By Leon H. Dembo, M.D.,

Washington, D. C.

The necessity for maintaining a constant, normal body temperature in infants suffering from malnutrition and atrophy, and in premature infants, and the failure of the many methods suggested to accomplish this, are responsible for the conception of the idea of the portable incubator.

This consists of an ordinary wooden box, 30 inches long, 15 inches wide, and 12 inches high, with 2 partitions removed (one end and the bottom). These dimensions may be changed according to the size of the infant. The interior is lined with asbestos paper (B), and a hole bored at the distal end (A), large enough to admit an electric socket (A). A thermometer (C) is hung inside, and a 60 Watt lamp attached to the socket. The connection is then made to a socket near the bed (E), and the box placed over the infant, leaving the head free. A sheet or blanket is spread over the box, including the open end (D), so that the head only is visible. The light, when on, will yield sufficient heat to maintain a temperature range of 80° to 100°. The temperature desired is regulated by the amount of air entering at the open end, which, in

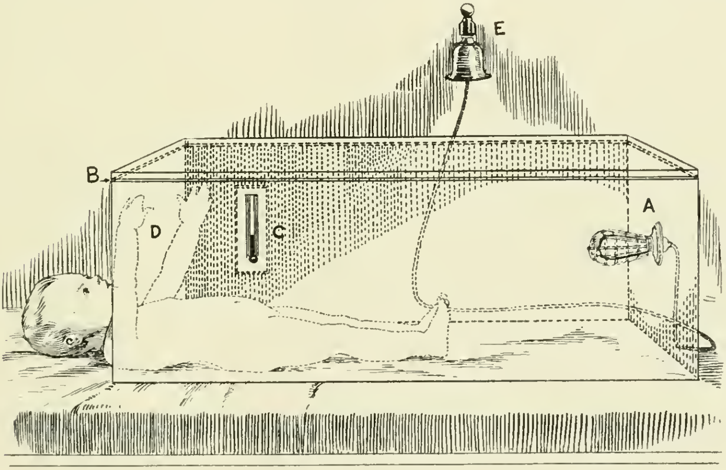


Fig 1. A portable incubator—Dembo.

turn, is controlled by raising or lowering the covering (D). A 60 Watt lamp need not necessarily be used. A smaller one may be substituted. The box can be lifted aside whenever any examination or manipulation of the infant is desired, and can be carried to any bed and connected. The entire apparatus can be quickly made, and at a trifling expense.

We have used this incubator successfully and its advantages, briefly, are these: (1) It is light and portable and can be easily and quickly adjusted. (2) The asbestos lining helps to maintain the heat, and the temperature is easily regulated by the partial or complete closure of the open end. (3) The infant's head lies free, thus preventing the injurious conditions (cracking of the lips, etc.), arising from exposure to high (incubator) temperatures. (4) The construction is simple, and any number may be made up at a very small cost.

CONGENITAL HYPERTROPHIC PYLORIC STENOSIS (British Medical Journal, Nov. 26, 1921). H. Tyrrell Gray and F. N. Reynolds present an analysis of 50 cases of congenital hypertrophic stenosis operated upon by the Rammstedt method from which these conclusions are reached: (1) Accumulating evidence supports Pirie's hypothesis, that hyperadrenalism causes pyloric hypertrophy, which is to be regarded as one of its manifestations. (2) Pancreatic and biliary insufficiency also resulting from hyperadrenalism, accentuate the pyloric closure and influence the mortality. (3) The sex preponderance (two males to one female) is of similar importance. (4) Gas and oxygen anesthesia will nearly eliminate operative fatalities, both immediate and delayed. (5) Operation should never be undertaken as an emergency. (6) Systematic preparation for operation by lavage and infusion is essential. Even moribund cases can be so rendered operable, and make a good recovery. (7) Such a preparation should never exceed four days at the outside. (8) Now that the operative mortality has been so greatly reduced by the employment of gas and oxygen (37 per cent.), operation is indicated as soon after the diagnosis as the necessary preparatory treatment will permit. (9) The possible risk of performing an avoidable operation is negligible when compared with the prejudicial results of the ineffectual prolonged medical treatment.—*Medical Record.*

CASE REPORTS.

Contributed by Oliver W. Hill, M.D.,

Knoxville, Tenn.

My reasons for presenting these case reports are two fold: First: The cases are intensely interesting, when the history and symptoms are compared to the post-mortem findings. Second: These cases were in private practice and post-mortems were done in the homes or at the undertakers. This proves that when one really wants to learn medicine from post-mortems, they can be obtained, and to my mind prove very profitable indeed. It is my hope that others may be stimulated to do more work of this character even if not accessible to the necropsy rooms of great hospitals.

CASE NO. 1.

Wilma R., aged 3 years. This child was referred to us by Dr. Hyder, Maryville, Tenn. She gave a history of some intestinal derangement for several months, otherwise negative. Child continually held finger in nostril, which I thought caused it to bleed. Examination showed a distended abdomen. Liver, 4 fingers below the costal margin. Spleen, palpable. Heart and lungs, negative. Petechial hemorrhages over extremities and back, rather pale in color, apparently of some days standing. Temperature, 101°. Pulse, 160? Appeared desperately ill. Child was referred to laboratory for blood count, Wassermann, and to be typed. Red blood cell count, 12,080,000, hemoglobin, 30 per cent., white blood cell count, 7,400. Wassermann, negative. Child bled profusely in the laboratory. The bleeding was relieved with difficulty and she died in about 3 hours.

Autopsy by Dr. H. C. Long.

Pathology.

Petechiae and ecchymotic areas scattered over extremities and trunk.

Thorax. Thymus: 2½ x 6 x 1 cm.

Lungs. Sero-sanguinous fluid covers cut surface. Sections from right lower lobe, show acini containing red and white blood cells and round cell infiltration of peribronchial tissues.

Heart. Petechiae scattered over pericardium.

Abdomen. Petechial hemorrhages of the serous surface of stomach and intestines.

Liver. Areas of congestion. Sections show cloudy swelling.

Spleen. Sections show cloudy swelling.

Kidneys. Approximately twice normal size. Nodular on surface, capsules strip easily, architecture normal.

Cultures. No growth on blood and agar media.

CAUSE OF DEATH. Pulmonary edema.

CASE NO. 2.

Boy, aged 5 years. This case was seen through courtesy of Dr. Herbert Bolin, Mascot, Tenn.

Family history. Brother died of tubercular peritonitis, one year previously.

Past history. Negative.

March 5. Child was well in the morning. In the afternoon, about 4 o'clock, was found unconscious in a nearby field by his playmates. Temperature (rectal) normal. Pulse full and regular. Abdomen, slightly distended. Able to swallow. Pupils both dilated, no reaction to light. Breath, very foul. Throat, clear. Few moist râles over both lungs.

Gastric lavage. Removed quantity of undigested food.

Good results from cathartic.

March 6. No change.

March 7. Patient seen in consultation with the family physician. Temperature, 101°. Pulse, 120, slightly irregular. Respiration, 26. Child was conscious and called for water.

Pupils. Equal and reacted to light. Kernig, negative. Babinski, negative. Knee jerk, diminished.

Stools. Frequent, foul odor, greenish in color and very thin.

Spinal fluid. Clear, very little increase on pressure: cell count, 16.

Urine analysis. Negative. Temperature, 103°. Pulse, 140. Respiration, 30. Very nervous and slight twisting of muscles on right side.

March 9. Temperature, 104°. Pulse, 140. Respiration, 30. Convulsions, paralysis, right unilateral. Unable to swallow. Tepid baths and ice cap to head and enemata, instituted the previous day, were continued. Bromides, per rectum. After this medication, the convulsions were less frequent.

March 10. No appreciable change. Temperature, pulse and respiration, fairly constant.

March 11. Temperature, 100°. Pulse, 100. Respiration, 24. Convulsions much lighter and less frequent and able to swallow. Right sided paraplegia still present. Treatment continued.

March 12. Pulse thready and irregular. Convulsions frequent. Death at 10:00 A. M.

Autopsy at 4:00 P. M. by Dr. H. C. Long.

PATHOLOGY.

Head. Meninges: Dura mater firmly adhered to skull and great quantity dark red blood escapes when the dura is incised. Pia mater thickened and covered cell infiltration of pia mater and exudate is made up of fibrin and pus cells.

Cultures. Pure culture of Gram positive diplococci.

CAUSE OF DEATH. Micrococcus lanceolatus (Fraenkel) meningitis. The striking phase of this case is the gastrointestinal symptoms in the beginning of the illness which later resembled poliomyelitis. The correct diagnosis was not suspected.

CASE NO. 3.

Aged 5 months, weight, 13 pounds. This child was first seen October 21, 1920. Had been complementary fed on malted milk and the breast. At this time the mother's milk failed completely. The child was placed on modified cow's milk. She gained weight steadily and improved in every way. She was seen again on January 27, when the mother called my attention to the rotary motion of the child's head from side to side. The child at this time weighed 19½ pounds, was 10 months old and slept well at night, enjoyed her food and seemed perfectly happy, the only unusual symptoms being the head movements and attendant nystagmus.

This condition was explained to the mother as clearly as our knowledge would permit. I assured her that the prognosis was good and that all symptoms of rickets had disappeared; that these symptoms, (head movements) usually disappeared in a few weeks or months. The child was brought back on February 7. Ten days later, on February 14, I still tried to reassure the mother. I heard nothing more of the child until March 12, when I was called at 4:00 A. M., the mother stating that the child was suffering, apparently with a pain in the abdomen. She had administered castor oil about midnight. I suggested that the child be given an enema. The mother called again in a few minutes stating that the child was much worse. I saw her at 6:00 A. M. She was breathing rapidly and with some difficulty. Her body and face were covered with hemorrhagic spots. Her feet and legs were almost solidly covered with these purple hemorrhagic areas. The mother then told me that she had consulted another physician who gave her some cod liver oil and malt. I made an effort to get help that I might do a transfusion, but the child died in about thirty minutes.

Diagnosis. Purpura hemorrhagica fulminans.

Autopsy. March 12, 1921, by Dr. H. C. Long.

PATHOLOGY.

Petechiae scattered over the extremities and trunk.

Thorax. Thymus: 2 x 4 x 1 cm.

Pleura. Cavities contain 15 c.c. respectively, of serosanguinous fluid.

Lungs. Cut surface covered with serosanguinous fluid. Sections from both lower lobes show few red and white blood cells in the acini and round cells infiltration of peribronchial tissue.

Abdomen, stomach and intestines. Petechial hemorrhages scattered over the serous surface.

Liver and spleen. Sections show small hemorrhagic areas.

Culture from blood and agar media. No growth.

CAUSE OF DEATH. Pulmonary edema. The question here is, what influence did the food have and what was the significance of the head movement? In other words, what caused the blood change?

CASE NO. 4.

Girl, aged 13 years. Child was brought to Fort Sanders Hospital by the family physician, with a diagnosis of intestinal obstruction, January 3, 1921.

Family history. One of 3 living children. Two other members of the family were taken ill at the same time, their illnesses being diagnosed as influenza, which cleared up within a few days under treatment.

Personal history. Nothing of importance.

Present illness. Onset sudden, 6 days previous to admission.

Chief symptoms. Persistent vomiting of all ingested fluids. The emesis consisted of dark brownish fluid for the greater part, and occurred at short intervals. Fluid nourishment produced immediate nausea and vomiting. Following proctoclysis some flatus and fecal material was expelled. Infrequent coughing, not productive in character. Restless, slept very little. Temperature had been 99° to 100°.

Examination. General appearance, well developed and nourished, female child about 13 years of age.

Head. Ears, acutely inflammed, both drums bulging.

Thorax and lungs. A peculiar high pitched note almost hyperresonant over both lungs, otherwise nothing was found.

Abdomen. Negative.

Reflexes. Normal. Temperature, 99°. Pulse, 86. Respiration, 20.

Laboratory. Urine, acid, specific gravity 1010. Albumen, positive. Epithelium. Hyalin and granular casts. Red blood count, 12,000,000; white blood count, 57,000. Differential count, polys, 90; small mononuclear, 10. Blood culture—No growth. Paracentesis of both drums, by an otologist (Dr. Jones).

January 4. At noon, delirium cordis was noted and heart sounds were obscured. Temperature, 99°. Pulse 150.

January 5. No change in the physical signs except the pulse was progressively weaker. Temperature, 99°. Pulse—160 (?). Slight serosanguinous discharge from ears. Supportive treatment was administered. Gastric lavage. Death at 7:30 in the evening.

Autopsy by Dr. W. T. DeSautelle.

PATHOLOGY.

Thoracic cavity. Free from adhesions and fluids.

Pericardium. Normal.

Heart. Normal.

Lungs. Engorged, moist, bloody. Partially collapsed and dark red. Surfaces are mottled by sub-pleural extravasations of blood. Very little fibrin on the pleura. The mucosa of the bronchi and trachea is similiarly dark and moist. No true consolidation. The most striking feature is the increased fluid exudation, blood tinged and thin. The condition is essentially and inflammatory, hemorrhagic edema. The cut surface is mottled, in general bright red, with irregular areas of darker red corresponding to hemorrhages and in places some grayish areas. The lung is soggy and yields much fluid, thin and bloody.

Liver. Normal in size, rather pale red, indicating parenchymatous degeneration, otherwise normal.

Spleen. Normal.

Stomach and intestines. Normal.

Kidneys in enlarged capsules stripped easily, parenchyma somewhat pale.

Genito-urinary. Organs normal.

Diagnosis. Influenzal pneumonia. There was very little, if any, physical signs of pneumonia or any pulmonary involvement on physical examination.

CASE NO. 5.

Baby, Arla, Ruth C. Admitted to Baby Home when 62 hours old, weighing 2 pounds. One month premature. Great difficulty was experienced in feeding: but upon breast milk, obtained from more than one source, made a slight but steady gain, weighing 6½ pounds at 7 months, 9 pounds at 9 months and continuing to gain a pound each month up to 14 months. At death, aged 19 months, weighed 17 pounds. First teeth erupted at twelfth month. Never walked or talked. Small but fairly well nourished and developed.

In January 1921 had whooping-cough, was given vaccine and made a good recovery; had chicken-pox April 1921. In October 1921, had severe otitis media which cleared up under expectant treatment. She was then well until January 3, at 1:00 A. M. when she began to cry out violently, leading the nurse to suspect that she had an ear-ache. Temperature at this time was 103°. Seen on the 4th, and diagnosis of pneumonia was made with pathology noted in right lung. She continued to run a temperature around 103° at times coming to normal, over a period of 5 days, during which time she coughed some, but appeared to be fairly comfortable and ate well. After temperature disappeared she seemed to improve rapidly until the 5th day, when her temperature again rose to 104°, fluctuating between this and normal for about 4 days. No cause could be found on physical examination for temperature. Examination of urine at this time was as follows: Turbid, straw, acid. Albumen, heavy trace. Microscopic, pus, large amount, urates. Pyelitis was naturally suspected and the child was put upon alkaline treatment, and fluids pushed. Temperature came to normal when urine showed alkaline reaction.

Again the child was free from temperature, for a period of 3 days; she then had a temperature of 101° and began to vomit. Bowels did not move for 24 hours and vomiting continued. The movement at the end of 24 hours was a thick stool with nothing abnormal apparent. Sunday, vomited at times, temperature 101.2°, stools showed streaks of blood, dark in color. Child was very uncomfortable, tossing about, and lay for the most part with thighs flexed on abdomen. Physical examination at this time showed a moderately distended abdomen, tympanitic except in the lower abdomen, with no tumor palpable. The child continued to have small tarry stools, passed flatus, and vomited. The vomitus was never stercoraceous. On Tuesday, seen by Dr. Lucius D. Hill, Jr., there was still distension, tympany except in the lower left abdomen, and a tumor palpable through the abdominal wall below and to the left of the umbilicus, and by rectal examination. The next day the temperature had come to normal and the child was apparently improved. Improvement continued up to Friday morning at 6:00 A. M. when she began to scream as if in pain. Temperature was subnormal. Died at 11:00 o'clock.

Autopsy, by Dr. W. T. DeSautelle.

PATHOLOGY.

Pale undersized child 19 months old. Adhesions lateral and posterior surfaces, upper lobe, right lung.

Lungs. Infarct (upper lobe) right. Infarct (lower lobe). They occupy at least one-third of each lobe-show, a sharp line of demarcation, and are wedge-shaped.

Heart. Walls, pale, muscle flabby.

Abdomen. No free fluid.

Intestines. About 8 to 12 inches of ileum dark red to black. Many adhesions and a thick yellow exudate covering these portions of the bowel. Located about the middle of the ileum. No obstruction. No intussusception. Dissection of mesenteric artery shows a firm clot, partially organized leading up to gangrenous gut.

Liver. Normal. *Spleen.* Normal. *Kidneys.* Normal. *Bladder.* Normal. *Adrenals.* Normal. *Stomach.* Normal. *Intestines.* Except as noted, normal.

Brain. Excess of bloody fluid in subarachnoid space. Left surface entire middle meningeal vein enormously enlarged with a firm clot, partially organized.

Cavities. Lateral ventricles dilated very much.

Ear. Pus in middle ear. (Dr. L. D. Hill, Jr.)

Mastoid cells. White exudate coming out.

Diagnosis. Thrombus middle meningeal vein. Infarct right lung. Thrombus—branch mesenteric artery.

CASE NO. 6.

Erma M., aged, 11 months. This case was seen through the courtesy of Dr. M. M. Copenhaver.

Family history. Father had rheumatic fever in 1919, 45 years of age, health good at present time. Mother living and well, 26 years of age. One sister living and well, 5 years of age. One sister died of unknown causes at 26 months of age, about 2 months before, with the following history: Child was taken ill suddenly the fourteenth day after tonsillectomy. Temperature 100° to 101°. Pulse 100 to 120. Respiration 26. Paralysis of pharyngeal, laryngeal and anterior cervical muscles. Results from operation were good and there was no evidence of inflammatory condition in the throat. Leucocyte count 28,400. Differential count: polymorphonuclear neutrophiles 89 per cent. Wassermann, negative. Death on second day of illness, September 3, 1921. No autopsy was made.

Personal history. Normal breast fed baby.

Present illness. Sudden onset, December 8, 1921. Temperature 104°. Perfectly quiet except for a rotary motion of the head. Eyes fixed. Apparently no pain. Constipated. Dec. 8 to 16, temperature varied from 102° to 105°. The stools were green after the bowels had been moved with castor oil. December 17, temperature dropped to normal and remained about normal all day. Dec. 18. The patient had a convulsion at 5:00 o'clock in the morning; the temperature this day had reached 105°. Spastic condition of muscles for 24 hours. Then a relaxation until death occurred, 24 hours later.

Laboratory reports. Wassermann, negative. Spinal fluid, fluid under considerable pressure, cloudy. Microscopical examination showed a large number of leukocytes, 85 per cent. polymorphonuclears, also a very large number of non-motile bacilli which proved to be Gram negative about the morphology of the T. B. but not acid-alcohol fast. Failed to get any growth on any of the ordinary culture media, including plain agar, dextrose agar, blood agar and broth.

Post-mortem examination, by Dr. Ray V. DePue.

No evidence of any pathology in the peritoneal, pleural or pericardial cavities. Laminectomy done in the neighborhood of the eleventh dorsal vertebra, cord found to be surrounded by purulent fluid containing enormous numbers of the same organisms as previously found in the spinal fluid on lumbar puncture, with a second failure to obtain any growth on artificial culture media.

The unusual coincidence of the deaths of 2 children in one family of, evidently, the same infection at different times and the fact that the microorganism could not be grown, is worthy of attention.

CASE NO. 7.

F. L. H., female, aged, 5 years. This case was seen through courtesy of Dr. Kyle Copenhaver.

Family history. Parents in good health. Two healthy children. One still birth, Feb. 17, 1920. Otherwise negative.

Previous personal history. Whooping-cough, spring 1920; influenza, fall of 1920, followed by otitis media, confined to bed 5 days; ear discharged one month, spring 1921.

Present illness. Previous to illness she had been in good health and weighed 37 pounds. On the morning of Oct. 30, 1921, she complained of soreness in the abdomen, asked for water frequently and coughed occasionally. When the family physician called in the afternoon, there was constant coughing, which was not productive. Temperature 98.3°, pulse 140, respiration 40. Nothing was found on examination except pallor of the face. Oct. 31, condition showed no change. November 1, consultation, Drs. M. M. Copenhaver and Oliver W. Hill. Persistent, frequent, cough, not productive. Scanty urination, 4 ounces obtained by catherterizing. Temperature 98.4°, pulse 150, respiration 45. Pallor of marked degree. Apex of heart in midclavicular line. Otherwise examination showed no abnormalities. Died at 2 o'clock on morning of November 2.

Laboratory report. Catheterized specimen of urine, albumen, heavy trace.

Autopsy. November 2, 1921, by Dr. H. C. Long. Heart moderately dilated and right ventricle filed with dark fluid. Thoracic and abdominal viscera, showed no microscopic abnormalities.

Diagnosis. Acute dilatation of heart. Causes, unknown.

CASE NO. 8.

This case was seen through the courtesy of Dr. H. L. Kitts, with following history:

Born December 10, 1920. Mother, primipara, 18 years, history of one miscarriage, which was induced about the third month on account of pernicious vomiting. Father, 23 years of age and in good health. Child gained and was normal until the end of third week when it began to have convulsions, the attacks occurring at intervals of 30 minutes. It would become cyanotic and almost cease breathing, the pulse correspondingly slow at times, reaching 30 per minute. These attacks would last something over one minute. The child would suddenly gasp, sometimes scream out, regain color and seem apparently normal. It was suggested the child had intercranial hemorrhage, probably of syphilitic origin. The mother and father both denied any history. Father had blood Wassermann made, which was negative. Notwithstanding this, we did a Wassermann on the spinal fluid of the child. Fluid was clear and with a slight increased pressure. Wassermann was 4 plus (Dr. DePue). Child died on sixth day of illness.

Post-mortem findings. Intercranial hemorrhage, large clot and free blood on right hemisphere. This case is conclusive evidence that you cannot depend on a negative Wassermann in the parent for a diagnosis, if the child has conclusive symptoms of lues that are very conclusive.

522 W. Church Ave.

ARCHIVES OF PEDIATRICS

MAY, 1922

HAROLD RUCKMAN MIXSELL, A.B., M.D., Editor

COLLABORATORS:

Rowland G. Freeman, M.D...New York
W. P. Northrup, M.D........New York
Henry D. Chapin, M.D......New York
Francis Huber, M.D..........New York
Henry Koplik, M.D..........New York
Walter Lester Carr, M.D....New York
C. G. Kerley, M.D...........New York
L. E. La Fétra, M.D.........New York
Royal Storrs Haynes, M.D...New York
Herbert B. Wilcox, M.D.....New York
Charles Herrman, M.D......New York
Wm. Henry Donnelly, M.D...Brooklyn
Frank H. Richardson, M.D....Brooklyn
Edwin E. Graham, M.D.....Philadelphia
J. P. Crozer Griffith, M.D..Philadelphia
J. C. Gittings, M.D.........Philadelphia
A. Graeme Mitchell, M.D..Philadelphia
Charles A. Fife, M.D.......Philadelphia
H. C. Carpenter, M.D.......Philadelphia
I. A. Abt, M.D.................Chicago
William P. Lucas, M.D...San Francisco
R. Langley Porter, M.D...San Francisco
E. C. Fleischner, M.D.....San Francisco
Oscar M. Schloss, M.D.........Boston
Maynard Ladd, M.D.............Boston
Charles Hunter Dunn, M.D.....Boston
Henry I. Bowditch, M.D.........Boston
Richard M. Smith, M.D.........Boston
L. R. De Buys, M.D.......New Orleans
Robert A. Strong, M.D.....New Orleans
John Foote, M.D............Washington
Joseph S. Wall, M.D.......Washington
B. K. Rachford, M.D.........Cincinnati
Henry J. Gerstenberger, M.D..Cleveland
Borden S. Veeder, M.D........St. Louis
Frederick W. Schlutz, M.D.Minneapolis
Julius P. Sedgwick, M.D...Minneapolis
William Weston, Jr., M.D..Columbia, S.C
A. D. Blackader, M.D.........Montreal
Edmund Cautley, M.D..........London
G. A. Sutherland, M.D........London
J. D. Rolleston, M.D...........London
J. W. Ballantyne, M.D.......Edinburgh
James Carmichael, M.D.......Edinburgh
G. A. Wright, M.D.........Manchester

PUBLISHED MONTHLY BY E. B. TREAT & CO., 45 EAST 17TH STREET, NEW YORK.

ORIGINAL COMMUNICATIONS

THE TREATMENT OF GONOCOCCAL INFECTION IN THE LOWER GENITAL TRACT OF FEMALE INFANTS AND YOUNG GIRLS.*

(With the report of a series of 74 cases.)

By Charles C. Norris, M.D., and Henry B. Mikelberg, M.D.

Philadelphia.

This report embodies the results obtained in the treatment of a series of 74 cases of gonococcal infection. In this series complications were not numerous. There was one case of suppurative inguinal adenitis, 4 other cases in which the glands were enlarged and tender, and one case of arthritis. In no case was there any involvement of the tubes or ovaries, although in nearly every case the cervix was infected. In the adult there is a definite percentage of cases in which the infection spreads from the cervix to the body of the uterus and hence to the tubes, ovaries and pelvic peritoneum. This upward invasion nearly always occurs at a menstrual period, or after the emptying of a pregnant uterus. As the child neither menstruates nor becomes pregnant, pelvic inflammatory disease is of extremely rare occurence despite the frequency of gonococcal cervictis in children.

---

*Read before the Philadelphia Pediatric Society, January 10, 1922.

Perhaps the chief clinical characteristics of gonococcal vulvovaginitis in the young is its chronicity, its resistance to treatment and its tending to recur after apparent cure. Recurrence is as a rule due to the persistance of an undetected area of infection, often within the vagina, and as the external genitalia may present no evidence of involvement and the discharge practically ceases, the films being also generally negative, the case is pronounced cured. In a few weeks or months the child returns, and at this time presents well-marked evidences of a recurrence. The frequency of this type of recurrence can be greatly lessened by performing a routine intravaginal examination with a cystoscope. We have observed many cases that would ordinarily have been pronounced cured, in which the cystoscope revealed a small unhealed lesion. Had the cystoscopic examination not been performed these cases would have been discharged as cured and would probably later have been classified as recurrences.

Although in this paper we have made no effort at an exhaustive clinical study, it may be stated that we believe the name vulvovaginitis is somewhat misleading. For although owing to the immaturity of the vaginal and vulvar covering, these areas are the seat of an actual infection, these are not the localities in which the disease tends to persist after treatment. The cervix, urethra, and, in a lesser proportion of cases, the Bartholin's glands are the harboring places for the gonococcus in the same manner as they are in the adult, and these are the points which should be especially examined before pronouncing a case cured. It is often necessary to direct intensive treatment to these areas, particularly in those cases which are resistant to the ordinary methods of treatment.

Our observations tend to show that Bartholin's glands are less frequently attacked than in the adult, and that when involved the infection is generally limited to the external portion of the ducts. The explanation of this may be the small calibre of the gland opening, and the fact that Bartholin's glands do not functionate so actively in the child. A miniature gonococcal macule is often present and in the majority of cases disappears spontaneously without the aid of special treatment such as is often required in the adult.

A certain number of so-called cases of recurrence are due to reinfection. Thus a child may be cured and return to its old environment and to the companionship of infected playmates, and reinfection occur through the same means from which the primary infection was derived.

We have also observed cases in which treatment has been continued, sometimes for prolonged periods, due to erroneous bacteriologic reports. It must be remembered that organisms morphologically similar to the gonococcus are normally present in the majority of normal cases, and unless the Gram stain is employed, serious mistakes are likely to be made; even with the use of Gram stain, errors may creep in, and are especially likely to occur if the bacteriologic examination is performed in a perfunctory manner or by an inexperienced worker. We have elsewhere cited a case (Norris & Mikelberg; Jour. A.M.A. Vol. 76, No. 3, p. 164, 1921) in which a non-specific inflammation was continued over a period of months as the result of a too vigorous treatment and of faulty laboratory technic

The routine employed by us in determining whether a complete cure has been effected is as follows:— After the discharge has ceased and all evidences of infection on the external genitalia and between the labia have disappeared, the following, most important part of the examination is undertaken. The child is placed in the knee-chest or extreme Trendelenburg position, the lower bowel and bladder having previously been emptied; the cervix and the entire lining of the vagina is inspected through a Kelly cystoscope equipped with a small, cold electric light. To obtain satisfactory results the vagina must be ballooned-out with air. This is not difficult, and with the pelvis elevated, expansion occurs as soon as the cystoscope is introduced through the hymenal opening. If no evidence of infection can be detected at this examination, treatment is continued for one week longer. A week is then allowed to elapse without treatment, and another examination, again employing the cystoscope, is made; if this is negative an examination is made 2 weeks later, another examination one month later, and a final examination after an interval of 2 months. At each examination specimens for a bacteriologic examination are obtained.

It has been our experience that gonococci are rarely demonstrated in a case that is clinically free from evidences of infection, as determined by a careful examination under a good light, and inspection of the ballooned-out vagina with the cystoscope.

Clinical signs of infection are, however, often present when the bacteriologic examination by means of films has proved negative. As a further safeguard, the patient is instructed to return for examination twice more, at 3 months' intervals, the understanding being that she must return at once should there at any time be a recurrence of symptoms.

Just what is the most effective treatment of gonococcal vulvovaginitis has long been a debated question. Many remedies have been suggested, but in our hands the most satisfactory plan has been the following:

Technic of Treatment. The child is placed in the Trendelenburg position, with the hips well elevated and the thighs spread widely apart. The external genitalia and vulva are cleansed with cotton moistened with a 1 per cent. oily Dakin's solution. (1 part Dakin's solution and 99 parts olive oil). About 3 drams of this solution are then introduced into the vagina by the means of a large medicine dropper. The instrument known as the "Little Jumbo" dropper has proved satisfactory for this purpose. The solution is injected into the vagina somewhat slowly, after which the instrument is quickly withdrawn, and the labia held together with the gloved fingers for about 2 minutes. The excess of oil is then wiped off. This treatment is administered by the physician twice weekly, and the mother is instructed in the method of its application. She is furnished with 3 ounces of the solution and a dropper, and is directed to apply the treatment night and morning. The infectious nature of the discharge is explained to her, and she is cautioned regarding prophylaxis, and especially as to the danger of conjunctivitis. In addition, each mother is given a card that tells in simple language of the infectious character of the disease, how it is spread, and the necessity for prophylaxis regarding towels, toilet-seats, etc. The importance of continuing the treatment until the infection is entirely eradicated is also emphasized.

Intensive treatment of the urethra and cervix is generally necessary during the end stages of the disease, and for this purpose mercurochrome has usually been employed. This treatment is similar in general character to that employed for cervicitis and urethritis in the adult. Among dispensary patients, if a child does not do well under the treatment, a social service worker is directed to visit the home for the purpose of ascertaining if the home treatment is being properly administered. If, during the course of treatment, the child is not brought to the clinic regularly the services of a social worker are again enlisted.

The cooperation of the Social Service Department of the Children's Hospital of Philadelphia has been of inestimable value in the treatment of our dispensary patients. But for it, many cases would have drifted away uncured. Despite every effort, it is often difficult to impress on an ignorant mother the importance of continuing treatment after the discharge has been checked and the outward evidences of the infection have disappeared.

The treatment just described is to be recommended because of its simplicity and the speed with which it can be applied. It is especially valuable for dispensary patients; it is painless, and the children soon learn this, thus facilitating its application.

The Dakin's solution does not keep well, and if it shows any cloudiness should be discarded. In some cases it is best to begin the treatment with a 0.5 per cent. Dakin's solution, employing this for a few days, and then substituting the 1 per cent. solution. The strength of the solution to be used does not depend so much upon the character of the lesion as upon the age of the patient. The 0.5 per cent. solution has, however, less curative powers than the stronger solution. The following table shows the results obtained in 63 cases:

Duration prior to treatment	Number of weeks of treatment	Number of consecutive negative film examinations	Time free from clinical symptoms
Average 6 mos.	Average 12 weeks	Average 10	Average 4 mos.
Shortest 3 days	Shortest 2 weeks	Fewest 6	Shortest 3 mos.
Longest 3 yrs.	Longest 26 weeks	Greatest 12	Longest 2 yrs.

Among these 63 cases there have been 8 recurrences. There has been no selection of the cases other than that we have excluded all cases which have not had regular treatment.

In the above table the period necessary to obtain a cure has been calculated from the time of the presence of the last clinical evidences of infection, as instanced by discharge or reddening externally, or as observed with the cystoscope, or a positive film.

No case has been included in this series in which the clinical diagnosis has not been verified by a bacteriologic examination. No case has been classed as cured which has not been followed for at least 3 months after the disappearance of the infection.

The average period required to obtain a cure in this series was 12 weeks, which is by no means unusually short. Some of our cases have been much more resistant. We have now under treatment one case which has been coming regularly to the dispensary of the Children's Hospital for 6 months and is still uncured. The percentage of recurrences, about 12 per cent., in the entire series, is unusually small. It may be that with a larger series this percentage will increase, or that a longer observation of these cases will show a greater number of recurrences. We believe that the routine use of the cystoscope, and the follow-up system of the social service worker is largely responsible for these results, and particularly the small number of recurrences.

Most cases yield fairly promptly to the above described form of treatment. In cases, resistant to the treatment, the following plan is employed:— The patient is placed in the extreme Trendelenburg or, better, the knee-chest position; the external genitalia are cleansed; a Skene bivalve wire uretheral speculum is then introduced into the vagina. If the lower bowel and bladder are empty and the child is in the proper position, the vagina will balloon-out.

The vagina is then thoroughly cleansed with absorbent cotton moistened in a non-irritating, antiseptic solution. A 1 to 10,000 or 1 to 15,000 potassium premanganate solution is satisfactory and is a moderately good mucus solvent. This cleansing should be done under good illumination, a head mirror being employed to throw the light into the vaginal canal. The vagina is then dried by means of absorbent cotton, and followed by hot air, until the vaginal lining and portio vaginalis assume a glazed appearance. A dentist's hot-air bulb may be employed for the latter purpose. With the speculum in place, the child is allowed to slip from the knee-chest posture down into the Sims' left lateral position, with a pillow under the hips. The patient is kept in Sims' position with the speculum in place, and the vagina ballooned-out for from 20 minutes to half an hour. It is important to see that the ballooning-out of the vagina is maintained. If hot air is not obtainable, the child should be kept in Sims' position a somewhat longer time. Thorough drying is essential.

As a final step the entire vagina, portio vaginalis, and external genitalia are liberally painted with a 1 or 2 per cent. mercurochrome solution, or any other gonococcide that may be desired. Intensive treatment to the cervix and urethra is also applied. This treatment is employed 3 times a week, and in the interval the mother or nurse applies a 1 per cent. mercurochrome or a 1 per cent. Dakin's solution twice daily, as previously described. In cases in which the hymenal opening is unusually small it is best to incise this membrane as a preliminary step, thus facilitating treatment and aiding drainage. This method of treatment has the disadvantages of being time consuming and difficult of application unless a certain amount of cooperation from the patient can be secured.

In the case of young infants or highly nervous children, it is generally impossible to employ this method. It is especially useful in chronic cases of long standing, where the patients have already been treated for months or perhaps for years. When the treatment can be properly applied, such cases usually clear up in about 7 or 8 weeks. One of the writers has stated elsewhere his belief that the chronicity of gonorrhea in women is due to reinfection from the depths of the tissue. By our treatments we are constantly curing the surface lesions, but the disease is continued by reinfection, due to gonococci in the deeper portions of the tissue and the glands.

The vaginal lining contains a few glands and is, in fact, not a true mucous membrane, but a modified form of dermis. Owing to the absence of glands, it lends itself very well to this form of treatment. The rationalé of the foregoing treatment is based upon the following points:— It affords an excellent means of thoroughly cleansing the vagina and cervix; any small areas of infection may be given special attention, either by using a head mirror in conjunction with the wire speculum or by means of a cystoscope. The cervicitis can thus be efficiently treated.

Room temperature is deleterious to the vitality of the gonococcus; desiccation destroys the organisms; the ballooning-out of the vagina smooths out all crypts and folds in the vaginal lining, and thus permits a very thorough application of the gonococcide, and lastly, and perhaps, of chief importance, exposure to the action of the air tends very definitely to develop the immature squamous epithelium. After 2 week's treatment by this method, development of the lining membrane is usually quite evident. Every gynecologist has observed the thickening that occurs in the surface epithelium of the vagina and of the cervix in cases of prolapse, and the skin-like appearance of these areas after they have been exposed to the air for prolonged periods.

Although the exposure to the air by means of the wire speculum is of much shorter duration, and the consequent thickening of the vaginal covering is much less, the same tendency toward the development of the squamous epithelium is observed. In cases of prolapse the microscope will often reveal the presence of a well-developed outer horny layer of squamous epithelium, such as is present in the derma. This does not occur in the treatment just described, but there seems to be a well-defined tendency for the vaginal lining membrane to assume the characteristics observed in the adult.

It should be remembered that true gonococcal vaginitis is comparatively infrequent in the adult. It is true that a vaginitis is present at times in those cases in which the vagina is constantly exposed to the action of irritating discharges, such as may result from suppurative cervical lesions. In these cases, however, the vaginitis is probably due largely to constant drenching with the irritating and toxin-laden exudates, and soon disappears when the discharge from the cervical lesions is arrested. In this connection we may refer to the clinical fact that gonococcal vaginitis is rarely observed in patients over 14 years of age.

Shortly before this time the vaginal epithelium tends to assume the characteristics of that present in the adult, and, as a result the infection generally disappears. We believe that the success of this treatment is dependent in large measure upon the development of the squamous epithelium in the vaginal and the cervix lining. This belief is strengthened by the clinical fact that in the treatment of vulvovaginitis the vulvitis always clears up quickly, much more rapidly than does the vaginal lesions. This is probably due to the development of the tissues covering the external genitalia, the inhibiting action of air on the growth of the gonococcus and, to a lesser extent, to the ease with which the locality can be treated. Thoroughness and regularity are of the utmost importance in the treatment of vulvovaginitis; of far greater importance than the selection of a gonococcide. Due to the persistence of the infection in some of our cases, we have of late been substituting for the oily Dakin's solution, a weak preparation of mercurochrome with satisfactory results. At the Children's Hospital we are now running a series of cases with mercurochrome alone. The more we see of gonorrhea in both the child and the adult the more are we impressed with the fact that the problem is not so much the choice of the gonococcide, as is the thoroughness and regularity of treatment and in this class of cases special treatment directed towards the cervix and urethra, for these are the localities in which the infection is most resistant to treatment.

The following table shows the results obtained in the treatment of 11 cases by the hot air method:—

Duration prior to treatment	Number of weeks of treatment	Number of consecutive negative film examinations	Time free from clinical symptoms
Average 12 days	Average 8	Average 12	Average 6 mo. Shortest 3 mo. Longest 2½ yrs.

This series is too small from which to formulate deductions. Among the 11 cases there were 2 recurrences. All the cases occurred in the private practice of one of the authors, and this fact accounts for the shortness of the duration of the disease prior to treatment.

CONCLUSIONS.

1. The cervix is infected in practically all cases, and in many cases the urethra and Bartholin's glands.
2. So-called recurrences are generally due to an undetected area of infection, often in the cervix. The frequency of this form of recurrence can be greatly diminished by the routine use of the cystoscope.
3. So-called recurrences are sometimes due to reinfection and this should be guarded against.
4. Thoroughness and regularity of treatment are of more importance than the selection of the gonococcide.

5. To obtain the latter among dispensary patients, the service of an intelligent social service worker is indispensable.

6. The name gonococcal vulvovaginitis is somewhat misleading, as the cervix is always involved except in the early stage. The urethra and Bartholin's glands are also often attacked and may require special treatment.

7. The reason for the susceptibility of the vulva and vagina is due to the immaturity of the squamous epithelium forming its lining.

8. The disease nearly always undergoes spontaneous cure prior to puberty, probably in a large measure due to the development of the tissues which occurs at this time.

9. Anything which can be done which promotes the development of the squamous epithelium of the infected area is a distinct aid in the treatment.

10. Some standard of cure should be arrived at. We suggest a period of not less than 3 months during which there has been no treatment and during which there has been entire freedom from all evidences of disease as elicited by thorough examination, the routine employment of the cystoscope, and frequent bacteriologic examination, safeguarded by the Gram stain.

11. When properly performed, positive film examinations are of distinct value. One or 2 negative film examinations, during the chronic stage of the disease, have little significance.

Chestnut and 22nd Street.

DECAPSULATION OF KIDNEY IN CHRONIC NEPHRITIS (Archives de Médecine des Enfants, Paris, Sept., 1921). Comby remarks that fifteen years have elapsed since various writers published a total of eleven cases of chronic nephritis, in children, treated by decapsulation. He does not know of any other cases in children since until Fowler's recent report of two cases in children, and Simpson's four. Fraser has also reported four subacute cases. Comby reiterates that these recent experiences in Edinburgh are strong testimony in favor of decapsulation of the kidney in grave nephritis in children, and he urges others to follow the example of these Scotch confrères.—*Journal A. M. A.*

INTRAPERITONEAL INJECTIONS IN INFANCY.*

By A. Graeme Mitchell, M.D.

Associate in Pediatrics, University of Pennsylvania.
Philadelphia.

The first mention in the literature of intraperitoneal injections of fluid is the report of Blackfan and Maxcy[1]. These authors state that they used the procedure upon the suggestion of Howland who saw it employed as a routine measure on the service of Professor Garrod at St. Bartholomew's Hospital, London. Since the appearance of Blackfan and Maxcy's paper, a number of observers have related their experiences with intraperitoneal injections [2, 3, 4, 5, 6, 7, 8, 9]. Most of the reports are favorable and the method is considered one which is without danger if properly performed, and of great benefit to the patient if dehydration exists.

The Advantages of the Intraperitoneal Route. When one realizes the frequency with which fluid is indicated in certain diseased conditions and the disadvantages of previously existing methods of furnishing fluid in those conditions, it is not surprising to find that the intraperitoneal injection of fluid is now widely used. Indeed, in many pediatric clinics, it has largely replaced enteroclysis and hypodermoclysis and even intravenous injections. The giving of fluid by mouth is often useless because vomiting causes its expulsion. When introduced by rectum, fluid will not be retained if diarrhea is present. Moreover, if the fluid given by mouth or rectum is absorbed, the absorption may be too slow for the urgent needs of the economy. Hypodermoclysis is a painful procedure and only a limited amount of fluid may be given in this way. Intravenous injection of fluid is not a simple operation nor is it devoid of danger and it does not lend itself to frequent repetition. The author has seen 3 cases in which the attempt to give arsenicals by injection into the longitudinal sinus resulted in unilateral convulsions. In one of these cases, an autopsy revealed an area of necrosis in one cerebral hemisphere.

Many of the disadvantages of administering fluid by other methods are obviated in the intraperitoneal route. Large amounts of fluid may be given in the peritoneal cavity. It is usually possible to give at least 150 c.c and often as much as 300 or 400 c.c. may be introduced before abdominal distention occurs. The fluid is all retained and quickly absorbed. Blackfan and Maxcy[1] quote Dandy and Rowntree to show that 40 to 60 per cent. of injected fluid is absorbed in one hour. The studies of Denzer and Anderson[7] have also shown the same rapid absorption. A case is cited by Blackfan and Maxcy in which only 50 c.c. of normal saline solution was found in the abdominal cavity at necropsy, performed 6 hours after 200 c.c. had been injected. In the author's experience there have been several instances comparable with the above which demonstrated the rapid way in which fluid was utilized even by the moribund patient. The injections may be repeated frequently —as often as every 8 hours if necessary. The technic is quite simple and easy of application. There is very little discomfort to the patient. The only pain is that which occurs when the needle is introduced through the abdominal wall. It is not at all uncommon for an infant to fall asleep while the fluid is flowing into the abdominal cavity.

---

* From the Medical Service of the Children's Hospital of Philadelphia. Read at the meeting of the Northern Medical Association of Philadelphia.

The Dangers of Intraperitoneal Injections. It is always fair to ask the question whether a therapeutic procedure is devoid of danger. Is there any risk of the needle entering the intestinal lumen and peritonitis developing? It has been shown repeatedly in animals and in the human subject that it is very difficult to injure the gut unless it is greatly disturbed. This fact can readily be demonstrated in the autopsy room by trying to puncture any portion of the gastrointestinal tract with a large caliber needle. Adhesions which bind the gut to the anterior abdominal wall would, of course, permit the direct entrance of the needle into the lumen of the gut—but such a condition as abdominal adhesions is rare in infancy. Faulty technic would make bowel puncture possible by introducing the needle so deeply into the abdominal cavity that it would catch a portion of the gut against the posterior abdominal wall. It is, therefore, great intestinal distention, adhesions, or faulty technic which explain the few cases of colon bacillus peritonitis which have followed intraperitoneal injections. Backes[6] reports 4 cases of purulent peritonitis after fluid had been injected into the peritoneal cavity under strict aseptic precautions. This same author also had 4 children, out of a total of 61, who were badly shocked following intraperitoneal injection, one of the

4 children dying in half an hour. Such complications must be rare. In the many hundreds of intraperitoneal injections given at the Children's Hospital of Philadelphia peritonitis has never developed and shock attributable to the injection has never occurred.

When intraperitoneal injections are administered to infants suffering from furunculosis, whether of the abdominal wall or elsewhere, there is a real danger of peritonitis, and such cases have been reported. It not infrequently happens in pneumonia, especially of the bronchopneumonia type, that a considerable degree of dehydration develops. In using intraperitoneal injections for the method of furnishing fluid in such a case, one should be careful not to give enough fluid to distend the abdomen to the point of embarrassing the respirations. After recent operations on the abdomen, intraperitoneal injections should not be given as they may cause sloughing of the incision. The author has witnessed 2 instances of this when fluid was given in the abdomen after operation for pyloric stenosis.

It should be mentioned in passing that Denzer and Anderson[7] by the use of capillary tubes, have obtained fluid from the abdominal cavity after intraperitoneal injections. Examination of the smears and cultures of this fluid has demonstrated that a sterile inflammatory reaction takes place. This reaction must be one of very mild degree because it gave no microscopic evidence of its presence in several cases which have been seen by the author at necropsy or at operation within a few hours after fluid had been injected into the peritoneal cavity.

The Indications for Intraperitoneal Injections. Briefly, the indication for intraperitoneal injection is present in any condition which is accompanied by dehydration. In those gastrointestinal diseases, whether acute or chronic, which are characterized by vomiting and diarrhea of sufficient intensity to cause rapid loss of fluid from the body, dehydration of some degree is always present. Other conditions which are not primarily gastrointestinal will frequently produce dehydration.

The lack of fluid in the body can be shown by the increase in the specific gravity of the blood, the increase in the serum protein, the change in the refractive index of the blood, or by more simple tests such as the estimation of the hemoglobin, or the red blood cells. Clinically, anhydremia is readily recognized by the shrunken condition of the patient, the depressed fontanel and the dry and relaxed skin. The normal skin is elastic but the skin of a dehydrated patient can be lifted from the surface of the body in folds which smooth out only after a perceptible period.

In infancy there is frequently encountered an acute nutritional disturbance following severe diarrhea, which presents a definite symptomatology consisting of rapid loss of weight, severe prostration, feeble circulation, fever, alteration in respiration and mental irritability or coma. To Marriott[10] we are indebted for the most logical explanation of the symptomatology of the condition. Marriott's views may be summarized. Due to the excessive water loss blood concentration occurs. Because of the blood concentration there is failure of urinary secretion with the result that a state of uremia exists. When renal function ceases there is an acidosis which is due, in part at least, to the fact that acid phosphate is not excreted. The decreased amount of water in the body available for evaporation explains the fever. The deep sighing respirations (air hunger, hyperpnea), which are present in the severer cases of this toxic condition, are the result of the acidosis [11, 12].

From what has been said of the etiology of this condition the therapeutic indications are clear:

(1) First, prevent water loss by methods which tend to check diarrhea. In this connection it should be remembered that fever is not a necessary contraindication to the use of such drugs as bismuth and opium. It is true that in the beginning of an intestinal disturbance fever is usually an indication of the presence of offending material in the intestinal tract, the removal of which should be encouraged. Later, however, rise in temperature may result, as Marriott explains, from the excessive water loss.

(2) If dehydration is present, fluid must be supplied by a method which permits the administration of large amounts of fluid which will be quickly absorbed. In most cases this will be by intraperitoneal injection.

(3) If sufficient amount of fluid is furnished, acidosis will be prevented, or, if present, it may be relieved. Various tests such as the hydrogen ion concentration of the blood serum, the carbon dioxide tension in the alveolar air or the amount of sodium bicarbonate necessary to render the urine alkaline, will demonstrate the presence of acidosis and its degree, even before the onset of hyperpnea. If hyperpnea is a symptom in the case, it indicates the administration of alkalies by mouth and perhaps the employment

of intravenous injections of sodium bicarbonate in addition to the intraperitoneal injection of fluid.

The Fluid Used in Intraperitoneal Injections. To the solution injected into the peritoneal cavity various substances have been added [2, 3, 5]. Ten per cent. glucose has been used and also 2-3 per cent. sodium bicarbonate. The use of glucose has been recommended because it is easily utilized and it has a definite caloric value. As a carbohydrate, glucose also spares protein destruction. It has been claimed that sodium bicarbonate used in intraperitoneal injections has an effect on acidosis. Some authors recommend Ringer's solution. The majority of pediatrists find that as good results are obtained by the use of simple physiologic sodium chloride solution as when other substances are added. With the salt solution alone there is less tendency to abdominal distention following the injection. In the light of our present knowledge it is better to introduce glucose or sodium bicarbonate intravenously if their use is so urgently indicated that the giving of these substances by mouth will not suffice.

The Number and Frequency of Intraperitoneal Injections. The number of times which intraperitoneal injections may be given and the length of time over which they may be employed is determined only by the extent to which fluid may be required by the patient. In other words, as long as dehydration exists, fluid may be injected into the peritoneal cavity. At times only 2 or 3 injections will be necessary, at other times as many as 20 or 30 injections must be given. The interval between injections varies from 8 to 24 hours and depends upon the urgency with which fluid is needed. If too much fluid has been given, edema will develop, the first sign of this being puffiness under the eyes.

The Technic of Intraperitoneal Injections. After first ascertaining that the bladder is empty and that there is no distention, the abdomen is painted with tincture of iodine. Physiologic sodium chloride solution at a temperature of 100° is now put into a sterile glass container which is graduated. The bottom of this graduate is connected by a rubber tube with a needle of 18 gauge having a point beveled at 45 degrees. The skin of the abdomen in the midline about one-third of the way from the umbilicus to the pubis is elevated between the thumb and forefinger of the left hand. The right hand plunges the needle, with the solution flowing from it, through the abdominal wall. The needle should be pointed in an upward direction and should be inserted just through the abdominal wall, the thickness of which will differ with the individual case. An elevation of the glass container of 2 or 3 feet above the abdomen will be sufficient to cause the proper rapidity of flow of the solution. When slight abdominal distention occurs the needle is withdrawn and a sterile dressing applied. The left border of the rectus may be used as the point of injection if so desired.

The Value of Intraperitoneal Injections. In estimating the value of a therapeutic procedure such as intraperitoneal injection statistics are apt to be misleading. It would be very difficult to compare the results of a group of cases in which intraperitoneal injections had been part of the treatment with the results in a group of similar cases treated without such injections. So many influencing factors would enter into consideration, such, for example, as the age of the patient, the condition of the patient before the onset of the illness, the existence of complications, the degree of dehydration, the degree of acidosis, the duration of dehydration before the injections were given, the number and frequency of injections, the amount of fluid administered, the effect of treatment other than intraperitoneal injections, etc.

Enough has been said, however, about the effect of dehydration to show the necessity of the administration of fluid when dehydration is present. In many hands intraperitoneal injections have proved a safe and efficient way in which to furnish fluid. It should be remembered that this method of combating water loss is not to be used only as a last resort but should be employed before dehydration has resulted in such serious damage to the kidney that it cannot resume its function, and before marked metabolic changes and protein destruction have occurred in the body.

1725 Pine Street.

BIBLIOGRAPHY.

1. Blackfan, K. D., and Maxcy, K. F.: Am. Jour. Dis. Child., 1918, XV, 19.
2. Epstein, J. P.: Arch. Pediat., 1920, XXXVII, 656.
3. McLean, S., and Lang, C. A.: Am. Jour. Dis. Child., 1920, XXIX, 359.
4. Aikman, J.; Jour. Am. Med. Assn., 1920, LXXIV, 244.
5. Weinberg, M.: Ztschr. f. Kinderh., 1921, XXIX 15.
6. Backes: München. med. Wchnschr., 1921, LXVIII, 1082.
7. Denzer, B. S., and Anderson, A. F.: Am. Jour. Dis. Child., 1921, XXI, 565.
8. Donnelly, J. D.: New York Med. Jour,, 1921, CXIV, 151.
9. Gittings, J. C., and Donnelly, J. D.: Am. Jour. Dis. Child., 1922, XXIII, 124.
10. Marriott, W. McK.: Am. Jour. Dis. Child., 1920, XX, 461.
11. Howland, J., and Marriott, W. McK.: Am. Jour. Dis. Child., 1916, XI, 309.
12. Schloss, O. M., and Stetson, R. E.: Am. Jour. Dis. Child., 1917, XIII, 218.

A CASE OF XANTHOMA TUBEROSUM, WITH EARLY JAUNDICE AND WITH DIABETES INSIPIDUS.*

By J. P. Crozer Griffith, M.D.

Philadelphia

Xanthoma tuberosum is in itself a rare disorder, and the peculiar combination and symptoms present in a case recently under my care would seem still more to warrant putting it upon record.

Roland T., aged 9 years, entered the Children's Ward of the Hospital of the University of Pennsylvania, September 21, 1921, with the complaint of "yellowness" and "swelling of the abdomen." The family history was unimportant. The patient was said to have been fat and rosy up to the age of 2 years. At 2½ years, he had pertussis. At 3 years, enlargement of the abdomen was first noted. It was stated by the parents that no mass of any sort was found by palpation at that time, and that the swelling lasted only 2 months. Apparently he was in good health from that date until January, 1919, except that his general nutrition was poor although his appetite was good. At this time the first attack of jaundice occurred. Recovery from the discoloration took place in from 2 to 3 weeks. In April, 1920, he had a fall, striking his head. This produced a lump on the cranium, which gradually disappeared; but shortly after this another lump developed which suppurated. Incision of this was made in September, 1920, and some diseased bone was scraped away. Probably on the ground that the condition might be syphilitic, injections of mercuric chloride were started in October, 1920, but given for only a short time. A few days after the beginning of these injections, icterus again appeared, and the abdomen became enlarged. Since that time he has remained icteric, emaciated, debilitated, and with large abdomen. Small cutaneous nodules developed in the palms and in the neck, and increase in the size of the liver was demonstrated by palpation. The appetite soon became ravenous, yet the emaciation and jaundice were unchanged. The digestion was rather poor. In the summer of 1921, it was observed that his sleep was much disturbed by the necessity of rising to urinate almost every half hour during the night. Urination during the day was also frequent, and large amounts were passed. He was also excessively thirsty and drank large quantities of water.

---

*Read before the Thirty-fourth Annual Meeting of the American Pediatric Society, held at Washington, D. C., May 1, 2 and 3, 1922.

Examination. Careful detailed examinations were made at different times, from which the salient features are abstracted here:

On entering the hospital the child was found emaciated, rather depressed, poorly developed, much under-sized, with a weight of 32 pounds 10 ounces—about that normal for a child of 3 years. The intelligence seemed normal. The whole cutaneous surface was deeply jaundiced, and there was an unusual growth of light-colored hair over the face and body. The skin was dry and in places excoriated from scratching. Over the right parietal bone there was a depression; doubtless the seat of the earlier nodule and abscess referred to. The skin over this region exhibited several raised papules. Over the face there were some scattered, irregularly shaped papules and maculo-papules, some of them of a distinctly parchment yellow color and with a shining appearance. These were most evident about the nose, the mouth and the eyelids,

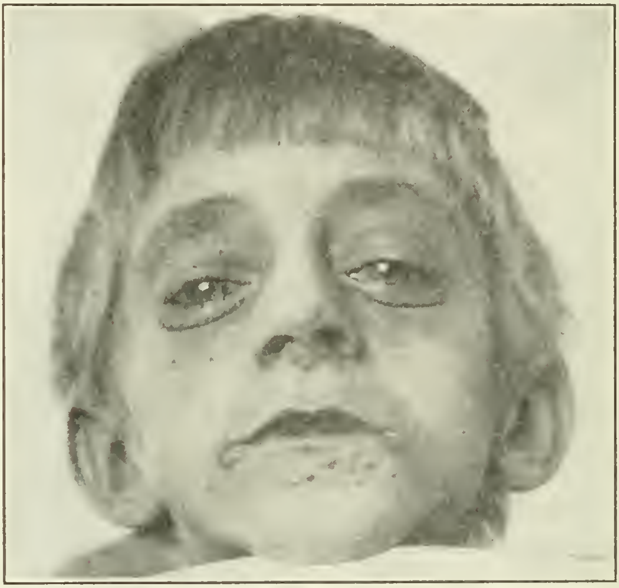


FIG. 1. The papules and maculo-papules were most evident about the nose, the mouth and eyelids, in the latter position producing, as a result, a decidedly thickened appearance of the lids.

in the latter position producing as a result a decidedly thickened appearance of the lids (Fig. 1). The mucous membrane of the mouth was somewhat drier than normal and icteric. The teeth exhibited irregularities in development, but there was nothing about them to suggest syphilis. There were very numerous, closely placed, small, flattened, yellow nodules toward the posterior portion of the neck. Nothing unusual was found wrong with the heart or lungs. The skin over the trunk showed small, yellowish nodules, and some of slightly larger size, especially in the axillae (Fig. 2). The abdomen was distended, particularly in the upper portion. The liver could be palpated 3 cm. below the costal margin, the surface felt uneven, and the percussion-dullness extended upwards to the 6th interspace. There was no evidence of enlarge-

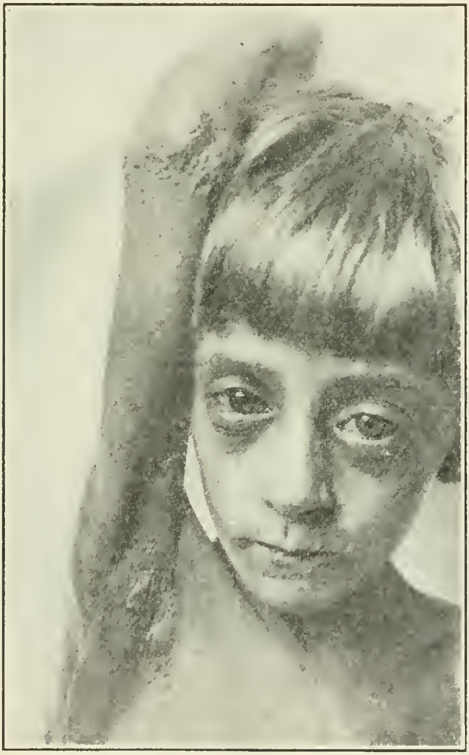


FIG. 2. The skin over the trunk showed small, yellowish nodules and some of slightly larger size, especially in the axillae.

ment or tenderness of the gall-bladder. The spleen could be felt 4 cm. below the costal margin in the axillary line. No ascites could be discovered. The extremities were wasted, and the nodules described were present on both flexor and extensor surfaces. They were especially large and abundant about the knees; and the palms showed numerous ridges and papules (Fig. 3).

Studies of various sorts were made during the boy's stay in the hospital. The temperature was afebrile with rare exceptions. Sometimes it ran rather below normal. The pulse-rate and respiration-rate likewise were undisturbed. The blood-pressure on his entrance was unusually low, equalling 78 systolic and 58 diastolic. Later it became higher by a trifling amount. X-ray examination revealed multiple small tumors of the skull, especially of the frontal and parietal regions, but no evidence of change of size of the pituitary body. Polyuria at first varied from 5000 to over 8000 c.c. daily, with a daily nitrogen excretion varying from 5 to 12 grams, and of sodium chloride from 3 to 6 grams. The specific gravity ranged from 1001 to occasionally as high as 1010. Biliary coloring matter was present. A very faint trace of

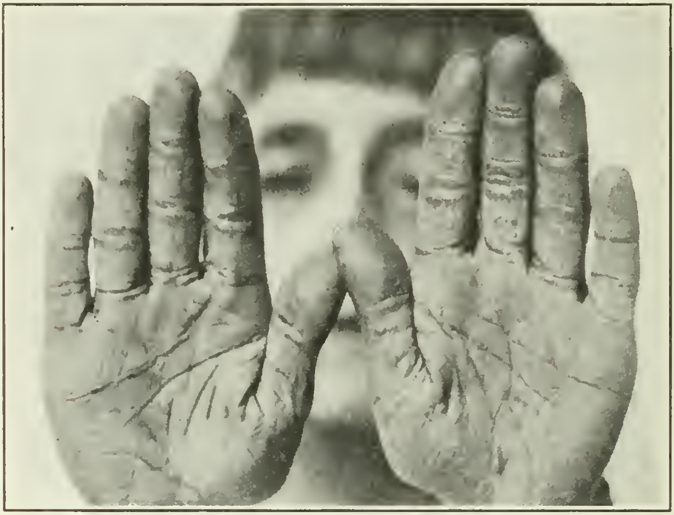


FIG. 3. The extremities were wasted, and the nodules were present on both flexor and extensor surfaces. They were especially large and abundant about the knees, and the palms showed numerous ridges and papules.

albumin was discovered on 2 occasions. Under the administration of an excess of sodium chloride, given to see what influence it would have upon the excretion of urine, the polyuria increased to 10,000 c.c. in 24 hours, without increase of the specific gravity. With the cessation of the experiment, the excretion of urine fell to what it had been before. The child was then given increasing doses of pituitary extract by the mouth up to as much as 2 grams, 3 times a day, without any effect whatever upon the polyuria or the polydypsia. Later, obstetric pituitrin-solution was administered hypodermically, 1 c.c. daily, and under this treatment, although the amount of urine secreted was reduced to normal, the specific gravity remained not above 1007. Simultaneously with this diminution of polyuria, the extreme thirst disappeared also. Temporary omission of the hypodermic injections was followed by prompt return of the polyuria. A phenolsulphonephthalein test gave 25 per cent. excretion in the first hour and 10 per cent. more in the second hour.

A study of the basal metabolism was made by Dr. Leon Jonas, and gave 50 calories per square meter of body-surface—"slightly below normal, but easily accounted for by the poor nutrition of the child."

Examination of the blood was made upon several occasions. There was no reduction in the amount of hemoglobin in spite of the general state of malnutrition. The red blood cells were also approximately normal in number. The number of leucocytes was slightly increased—10,900 on one occasion, 13,900 on another. The test for the fragility of the red blood corpuscles showed this to be partial with a solution of 0.375 per cent. and still incomplete at 0.25 per cent., i.e., there was an increased resistance to hypotonic salt-solutions. The blood-sugar was 0.06 per cent.; blood-cholesterol 397 mg. per 100 c.c., and the Wassermann reaction, negative. Examination of the feces showed them to be of a grayish color, with an excess of fat but no bile-pigment present.

The boy was in the hospital from September 21, 1921, to November 20, 1921. During this time he gained in all about 2½ pounds in weight, and left the institution with the polyuria controlled by the hypodermic injections of pituitrin, but with no prospect of it remaining so unless treatment was continued. In general, the condition was very much as when he entered, and with the xanthomatous nodules and the jaundice practically unchanged.

The case was of interest from many points of view, which, however, can be merely pointed out, without any lengthy discussion of them in this connection. The occurrence of jaundice, which is quite frequently observed in combination with xanthoma in adult life, would appear to be very rare in childhood. The dermatological text-books of Stelwagon and of Hartzell, for instance, state that it does not occur at this time of life, and a personal communication from Dr. F. C. Knowles confirms this view of its rarity. The cause of the jaundice can only be surmised. The fact that tumors were discovered on so much of the surface of the body, and in the bones of the skull, gives every reason to believe that the enlargement of the liver and the jaundice depended upon xanthomatous nodules, obstructing the biliary passages in this organ. Still more extraordinary is the combination of xanthoma with diabetes insipidus. A somewhat similar case was reported by Pusey and Johnstone (Jour. Cutan. Dis., Dec., 1908). Reference was made by them to the rarity of the combined conditions, the report of no similar case having been discovered. Naturally one thinks of the possibility of the polyuria being dependent upon a xanthomatous tumor affecting the region of the pituitary body. Of this there is no proof, but although the x-ray examination did not indicate any trouble in this region, it seems perfectly conceivable that some xanthomatous changes may have been present in this organ which radiography could not reveal. The action of the giving of saline in increasing the polyuria is also of interest, showing the inability of the kidneys to concentrate the urine—a characteristic of this disease. The more salt given, the more urine had to be secreted to maintain the low specific gravity. The experiment confirmed in part the tests which have been made previously by investigators, and indicates that the disease in this case was a primary polyuria, and not a primary polydypsia. It has been shown that pituitrin will permit of the concentration of the urine and increase the specific gravity, but in my patient this was not the case.

THE RELATION OF INFANTILE CONVULSIONS TO EPILEPSY*.

By Charles W. Burr, M.D.

Physician to the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases.
Philadelphia.

This paper is based on a study of 1654 epileptics treated at the clinics of the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases. In 305 cases, epilepsy began between birth and the fourth year, with an interval of less than 2 months between the first and later fits. 249 patients (15 per cent.) had convulsions in infancy, followed, after a period of many months, or in many cases several years, by epilepsy. When we subtract from the total number the patients (1247) whose first fit occurred after the fourth year the percentage rises to 39.

But this is only part of the problem. Though we can determine the percentage of epileptics in any series of cases who have had convulsions in infancy, and then have passed a long interval before the disease epilepsy becomes established, we have no statistics concerning infants who have a convulsion, or series of convulsions, but do not become epileptics. Until we know the number of these children, the true percentage chance can not be known. It is not enough to keep in touch with such children during childhood in order to find the frequency of epilepsy; their history throughout adolescence, and indeed into maturity, would need to be known.

Pediatricians of late years have laid great stress, when studying the relation between infantile convulsions and epilepsy, on spasmophilia. John Lovett Morse describes it as follows: "Another common cause of convulsions, which is far more common than is usually appreciated in infancy and sometimes in childhood, is spasmophilia, a condition in which the normal balance between calcium and magnesium on the one side, and sodium and potassium on the other is disturbed, so that there is a relative diminution in the proportions of calcium and magnesium and a consequent increase in the irritability of the nervous system. When convulsions are due to spasmophilia, there is often a history of attacks of laryngismus stridulus or tetany. In such cases mechanical irritability of the nerves is usually increased, as can be shown by trying Trousseau's and Chvostek's tests. In a doubtful case, the presence or absence of spasmophilia can be easily determined by testing the electrical excitability. The appearance of cathodal opening contractions under 5 milliamperes is pathognomonic of spasmophilia, and of anodal opening contractions, with less current than that causing anodal closing contractions, very strong evidence in favor of it. Although spasmophilia is a very common cause of convulsions, especially in infancy, it is often overlooked or forgotten. It should always be thought of and looked for in every case of convulsions in early life." He further states that "if evidences of spasmophilia are found, epilepsy may be excluded." From the context, I judge him to mean excluded at the time. He surely does not mean that spasmophilia protects against a later epilepsy.

---

*Read before the Philadelphia Pediatric Society, February 14, 1922.

A. Graeme Mitchell and Wilford Barber state, "every child manifesting symptoms of the spasmophilic diathesis also presents evidence of rickets." Mitchell further states that "the convulsions of spasmophilia do not predispose to epilepsy." I have no statistical material on the question of rickets and an after-coming epilepsy, but I can go this far safely—not many of my patients, seen later in youth, have shown any of the residual signs of a rickety condition in childhood, though quite a few have a history of having had laryngeal spasm in infancy.

The variability in the length of the interval between the first fit or fits and the establishment of epilepsy warrants some attention. In one only was the interval as short as 6 months. Of those (males 93, females 58) in whom exact ages were given, the most frequent interval for males was 6 years (10 cases), for females 12 years, (6 cases). 55 males had intervals from 5 to 13 years pretty equally distributed. In females, the intervals were about the same.

One man had an interval of 33½ years. He was prematurely born, had one attack at 6 months and none thereafter till 34 years old. I saw him a year later. He was then having weekly fits and showed no mental failure nor evidence of gross brain disease. It seemed a true idiopathic case. Another male patient had convulsions for an indefinite time up to the 5th year and was then free for 34 years. His, too, seemed to be a real case. I do not think there was more than an accidental relation in either case between the early convulsions and the epilepsy.

I have not included any cases of so-called senile epilepsy, because in it there comes the element of renocardiovascular disease. Four patients had convulsions at or very soon after birth and then were free from them for 4, 9 and 15 (2 cases) years, respectively.

One was the offspring of an intemperate father and a mother who had convulsions when a child. He was delivered with forceps and suffered some injury which resulted in convulsions at birth and a palsy of the left leg and probably whole side. The convulsions ceased in a day or two and he learned to walk at the usual time, which means that the palsy must have been transitory. He remained well till his ninth year when the convulsions recurred and had continued for a year when I saw him. He then had no sign of a residual palsy and was mentally up to the average. No clear history was obtainable as to the exciting cause of the recurrence of the fits.

The mother of the second of this group of children with convulsions at birth herself had had chorea. The child came uneventfully into the world, but three days later had a series of general convulsions. She was then free of symptoms till her fourth year when minor attacks commenced, twitching of the eyes and momentary unconsciousness. These still were present (recurring 10 to 20 times daily) when she came to the clinic in her ninth year. She showed no signs of organic physical disease and, though not an imbecile, had poor intelligence, poor memory and peevish disposition. I suspect she retrograded mentally later. It is impossible to say whether the convulsion on the third day prepared the brain for the later minor epilepsy.

The third case was that of a boy, three of whose siblings had died in infancy before his birth, which was alleged to have been normal. One hour later however, he had a convulsion or a short series. He then remained well until his 15th year, when minor attacks began and continued frequently. Major attacks were very rare. He was somewhat dull mentally.

No conclusions can be drawn from these 4 cases as to whether the convulsions at birth stood in any causative relation to those which came on years later. Of course the problem is very different in the cases in which there is a gross injury during birth to the brain, a lasting brain lesion which may become irritated years after.

The question of intervals of freedom from attack is not as simple as it seems from what I have said so far. I have spoken only of cases in which sometime during childhood a convulsion has occurred, or a series, and then have not recurred for at least 6 months. But we find clinically there may be, apart from medication, long periods in which the patient is free from convulsions. This is, of course, a well known fact and throws much doubt on much therapy in epilepsy. I shall report briefly a few cases. They are important because if they can occur, may not the earlier intermission be only a part of the epilepsy?

The first case seems to show that in some children there must be several cerebral insults before epilepsy can be firmly established. The girl's mother was very nervous, a bad sleeper but had had no definite disease. One brother had convulsions during teething. The patient came into the world without difficulty and thrived until at the 13th month (the mother is positive both as to her good health and the time of teething) the first tooth was erupting. She then had a short series of convulsions. At two years, without known cause, they recurred for a day. At 4 years, during scarlet fever, they again recurred and at 5 years, during diphtheria, they became permanent. She came to the clinic at 19 years and was then having about 5 major attacks weekly.

The second patient was born at 7 months following a fall of her mother, an incident which so frequently precedes, if it does not always cause, the miscarriages related to us in the examining room, and immediately was convulsed. She remained free from convulsions till her second year when she had another series lasting a day or two. They recurred at 12 years, 14 years, and again at 20. They became frequent and were present when I saw her in her 30th year. Her attacks then were both minor and major and the frequency of the large attacks varied from twice to a dozen times a month; concerning the minor ones it is always impossible to get an accurate statement. For an uneducated epileptic, or even for one who had had every advantage, she was an unusually intelligent and even-tempered person.

The third patient differed from the preceding in that at first there was not merely a convulsion, or a short series, and then a long interval, but a period of three years of convulsions and then a free interval of 5 years. She was aided at birth by instruments but had no convulsions till the fourth year, and they became permanent only in her ninth year. The attacks were both minor and major, the latter affecting predominantly, but not exclusively, the right side and beginning in the right arm. She had minor attacks daily or several times daily, the major occured only 5 or 6 times a year.

The family history of the fourth patient was not satisfactory but this much is certain: one brother had chorea. The patient had an uneventful childhood till his sixth year when he had a short series of causeless convulsions. They recurred again at the 17th year for a day or so and at 21 years became permanent. The attacks are major and not frequent.

The fifth case is that of a man who began to have attacks in infancy and continued to suffer till his seventh year when they stopped, to recur again for a short time at 14 years and finally became permanent at 27 years. He came to the clinic at 49 years, having monthly major attacks.

Inasmuch as there is a popular opinion that long intermissions, independent of treatment, are common in epilepsy, it is noteworthy that they are recorded in the histories of 5 only of the 249 cases. This is below the percentage of all epileptics, because we are dealing with people who have had a free interval, of at least six months, after the first convulsion of any kind, from any cause, who later became idiopathic epileptics. Also only cases were counted in which it was definitely known the patients were off treatment at and for a time before the interval.

The only conclusions we can draw are: That infantile convulsions are not necessarily the forerunners of epilepsy. A definite cause such as indigestion, either from over eating or bad food, or some febrile infection is of less serious import than a convulsion occurring while the patient is in apparent good health. In many cases the interval between the first and second fit is so long, several years, that there is probably no relation between them.

ACID INTOXICATION DUE TO FOOD POISONING*

By Theodore LeBoutillier, M.D.

Philadelphia.

While much has been written regarding acid intoxication or acidosis, there is still a vast amount of knowledge to be gained before the underlying cause has been established and we are able to treat this condition intelligently. It is agreed by all that in this condition there is a diminution of the alkali reserve, which is either relative or positive, with an excessive formation of acids and a change in the blood from a slight alkalinity to an acid condition; but as to the reason for this, opinions differ. It is thought by some that it is due to an increased fat metabolism with an insufficiently rapid elimination of these products by the liver and kidneys; or to an abnormal diminution of the carbohydrates, or to some interference with their digestion. Starvation and constipation are also given as causes of this condition as they increase acetonemia. Certain forms of toxemia produce or aggravate it; such as, general anesthetics, or the salicylic compounds; it is found in the acute febrile diseases, in severe diarrheas, intestinal autotoxication, and recurrent vomiting.

Having been found in so many different conditions has led to the discussion as to whether acid intoxication, with the production of acteone bodies and its symptom-complex, is a primary disease, or only a secondary manifestation of the disease, or condition with which it is associated. The study of a series of 12 cases has led me to believe that the latter theory is the correct one.

It has been found that in each case studied there has been a positive skin reaction to one or more of the food proteins used.

The toxin from the food which is the poison for the individual case is liberated more or less slowly in the general economy until the breaking point is reached, when an explosion takes place. This latter is caused by one of many things; in the nervous child it may be by some over-excitement, such as fright or sudden shock, fatigue, a party, or being taken to the movies. In the poorly nourished, a sudden change of temperature, usually from heat to cold, some acute illness or a traumatism will be found to be the underlying or exciting cause. These act as the spring which liberates the poison from the liver, where it has been stored, and we have the picture of so-called acid intoxication.

---

*Read before the Philadelphia Pediatric Society, January 10, 1922.

The child in the interim between the attacks is to all appearances in a normal or near-normal condition, with a fair to good digestion. Until the next outbreak occurs it looks as though there might be no return, but, unless the offending foods are removed from the diet, there will be another attack at a shorter or longer interval. If the tolerance for this food increases, the time between attacks will lengthen until the point is reached when tolerance is complete. If, however, that food or foods be entirely removed from the diet of the child the attacks will cease at once and not return, while there will be noted a very marked improvement in the general condition, an increase in weight, which in most cases has been stationary for some time; nervous symptoms lessened to a marked degree; a more normal digestion with better stools and in many instances, where constipation has been marked, there is a gradual improvement until no medication is necessary.

Tolerance for the offending food seems to be lessened when a moderate to large amount of fat is included in the diet and it was probably from this fact the theory arose that fat was the cause of this condition.

Case I. T. L., age 2¾ years, was the reason for this study being made. He was first seen, during a severe attack, on August 20, 1920. Had been having attacks of acidosis since November, 1919, at more or less regular intervals of about 6 weeks. When seen the condition was that of severe recurrent vomiting associated with all the symptoms of acid intoxication. As the diet, following the attacks, had been carefully regulated there was little change to be made; however attacks of varying intensity occurred in September, October and November. As a last resort and to find if there was any possible food acting as the cause he was tested for all of the 16 food proteins contained in his diet. The result was that reactions were obtained from carrot and spinach. These were at once cut from the diet, no other change being made. Since that time there has been no attack of any kind in the year and 7 weeks which have elapsed, except an acute indigestion occurring on April 6, 1921, which followed the drinking of 6 ounces of cream, and from which he recovered in 2 days without any of the symptoms of acid intoxication. Butter and cream have been gradually added to his diet and he is now a perfectly normal child; gains weight steadily, has lost all nervousness and has a perfect digestion. So far no carrot or spinach has been given.

Case 2. A.M., age 2 years and 8 months. On May 7, 1921, he had a typical attack of acid intoxication. A similar attack had occurred just a year prior to this one. The urine during the last attack gave a very marked acetone reaction. On May 28, 1921, he was tested for the 16 food proteins contained in his diet and a reaction was obtained from cow's milk. Casein and lactalbumin were then tried and a positive reaction occurred in each. He had been taking 10 ounces of milk 4 times daily besides his other food. The milk was cut from his diet, except for a small amount once daily on the cereal, and he began to improve at once. On November 11, 1921, he was again tested for casein and lactalbumin with the result that a positive reaction was obtained for lactalbumin while the casein was negative. He is now taking a casein milk with good result. Here the tolerance for casein has been established by the use of small quantities of milk, and I expect that in another 6 months lactalbumin tolerance will have been established.

This case is also of interest from the fact that the first attack followed overheating followed by rapid chilling and a fall, striking his abdomen on a corner of an express wagon.

Case 3. V.M., sister of the above, age 8 years. Since early childhood she has had an aversion to eggs and oat meal. There have been many attacks of indigestion with symptoms of acidosis. She gave marked reactions to egg white and oat, none to egg yolk or other foods. There has been no attack of any kind since those 2 foods have been eliminated.

Case 4. M.R., age 3 years, first seen April 29, 1921, during an attack. History that since last August she has had frequent attacks of vomiting which would last from 3 to 4 days and recur every 2 or 3 weeks. When seen she had a temperature of 101.6°, pulse 130 and rather irregular; there was slight air hunger and vomiting every half hour. Between that date and May 20, 1921, she had 2 attacks, neither of which was as severe as the first one seen. The protein food test was made May 20, 1921, using 20 proteins, which were all that her diet included. Positive reactions were obtained from lettuce, carrot and rice. These vegtables were taken from her diet and there has been no recurrence of the attacks. It is interesting to note that on July 14 she had soup in which one carrot had been cooked, unknown to her mother, and that 2 days later a very transient attack of vomiting with acetonemia occurred, lasting less than 24 hours.

CASE 5. S.D.M., age 2 years, first seen August 13, 1921, during a severe typical attack of acid intoxication. History of having had 4 such attacks during the past year. On September 7, the food protein tests were made with the result that positive reactions obtained from carrot, pork, barley and rice. Since that time there has been no recurrence; she has gained much weight and, instead of being an irritable unhappy child, she has become normal in every way.

CASE 6. J.A., age 9 years; he has been a difficult feeding case since he was 2 years old and has had frequent attacks of severe indigestion, always associated with acid intoxication. Never strong, poorly nourished, high strung, irritable; troubled by frequent attacks of bronchitis and tonsillitis. Tested on November 5, 1921, obtaining positive reactions from lima bean, string bean, pea, carrot and pineapple. While the time has been short since the test was made and the diet restricted, his health has been better than for years.

CASE 7. E.W., age 6 years. Last February he had a severe attack of acidosis accompanied by frequent attacks of vomiting lasting 6 days. He has had no recurrence but on testing him, November 7, 1921, we found that he reacted positively to pork, asparagus, carrot, oat and pineapple. Since these foods have been eliminated he has shown marked improvement.

CASE 8. E.J., age 3½ years. He was said to have had milk poisoning shortly after birth. At two years he had an attack of "intestinal grippe," from which he has never recovered. Has had much intestinal pain at frequent intervals, associated with vomiting and diarrhea; at other times he is inclined to be constipated. He was the typical picture of malnutrition when first seen. His weight remained stationary at 32½ pounds from September 29 until November 7, when he was tested. Positive reactions were found from beef, barley, corn and plum. They were removed from his diet and there has not been at attack of pain, vomiting or diarrhea since. He has gained a pound and a quarter in weight and shows much general improvement.

Case 9. E.W., age 9 years, has always been a sickly boy, with much difficulty in feeding. For the past 3 years there have been frequent attacks of indigestion associated with acid intoxication. Tested on November 20, 1921, obtaining positive reactions from tomato, onion, asparagus, squash and beef. The interesting point about this case is that the reaction for tomato was the strongest that I have so far obtained; and, further, in going over the diet he had before the 2 last attacks, which occurred just a month apart, the test being made after recovery from the last, we found that the night before each attack he had eaten tomato, either as a vegetable or in soup.

Case 10. R.A., age 1 year and 8 months; he has had 2 attacks of acid intoxication, one in May and the second in August, while at the sea-shore; the first followed eating a small amount of egg; the cause of the second is not known. Tested November 25, 1921, with positive reactions to pea, carrot, cocoa, egg, pork, squash and asparagus.

Case 11. B.L., age 6½ years, has been a delicate boy since birth, with frequent stomach and intestinal upsets, associated with slight acidosis. On November 28, 1921, positive reactions were obtained from peach, plum, fig, carrot, squash and tomato. Has gained one pound in weight since that time. Only 2 pounds in last year.

Case 12. F.P., age 4½ years. History of having been a normal boy up to 2 years of age, since which time he has had many attacks of acid intoxication, with much vomiting; these have occurred as frequently as once a month. He was tested on November 29, 1921, and was found to react to a larger number of food proteins than any other case. The most marked reactions were to banana, carrot, celery, and cocoa, while to a lesser extent reactions occurred in string bean, peanut, plum and strawberry.

Case 13. S.S. was really a control. She was 3½ years of age and has a congenital dilatation of the colon with all of the associated symptoms of this condition. She was tested with the 19 food proteins which constituted her diet to determine whether any food was increasing her trouble; a negative reaction was given by all of them.

While I realize the small number of cases reported and the short time elapsing since 6 of them were given the test, it seems to me that the results obtained are worthy of consideration.

The number of foods giving positive reactions is of interest, as out of the total of 42 used in the different cases, reactions have been obtained in 24 of them. Another important point is that carrot has been positive in 8 out of the 12 cases, showing that this food should be given with caution to children, if not eliminated entirely from their diet. Pork (bacon), plum (prune), asparagus, squash and cocoa gave reactions in 3 cases each, while beef, barley, rice, oat, pea, string bean, tomato, pineapple and egg each reacted twice. Banana, peach, fig, strawberry, peanut, celery, corn, and lima bean reacted in only 1 case each.

The following conclusions have been reached: most cases of acid intoxication or recurrent vomiting have for the underlying cause a food intolerance which if found and removed will cure the conditon; that many attacks of acute or chronic indigestion in children are also caused by food intolerance and that many of the cases of malnutrition will be much benefited and in time cured if the protein food tests are used and any food that shows a reaction be removed from their diet. At various periods the attempt should be made to overcome the intolerance to these foods by the careful administration of small quantities of them at decreasing intervals.

2008 Walnut Street.

THE RÔLE OF ACUTE INFECTIOUS AND CONTAGIOUS DISEASES IN CHILDHOOD IN THE ETIOLOGY OF CARDIOVASCULAR DISEASE IN THE ADULT.

By Alvin E. Siegel, M.D.

Assistant Pediatrist, Methodist Hospital; Associate Pediatrist, Jewish Hospital; Late Chief Cardiovascular Examiner, Camp Dix, N. J.

Philadelphia.

It has long been asserted that acute infectious diseases in childhood are causes of cardiovascular disorders of the adult. This impression has been handed down through several generations of physicians much in the manner in which information was passed on from father to son in the tribes of man in the days preceding the development of graphical recording of such information. Therefore, scant references are found in the literature. Although this fact has been known for years, it is remarkable that many physicians fail to apply in practice means of avoiding these rather serious sequelae, and that the laity considers some of these diseases so trivial that they neglect to have medical supervision for their children during these attacks.

During a period of service in the army, the writer was in a position to collect information that serves to show that infectious diseases of early life may be the cause of definite cardiovascular disability in later life. These cases were a series of young men of the ages of 21 to 31, who, because of damage to the circulation, were found to be unfit for any military service and were recommended for rejection. It is to be noted in passing that this group did not include all of the cardiovascular abnormalities found, but that these were the cases that were considered as undesirable for service. These men were examined after a maximum stay of 48 hours in camp, and therefore it is certain that all of these disabilities were incurred prior to enlistment, either in childhood or in early adult life. Many had no idea of the existence of cardiovascular abnormality; but again it may be of interest to note that while many of those having lesions of grave significance were ignorant of their presence because of the absence of symptoms, even those who had been accustomed to severe physical strain in their work or in athletics, others having no organic changes in the heart but with various functional disorders, complained of subjective symptoms which seemed greatly in excess of the severity of the condition. This point is worthy of consideration, because, in the handling of these functional cases, the physician may unjustly class the patient as a malingerer or as a neurasthenic, and by so doing the patient gets little treatment or care which is of any value.

The circulatory disturbances diagnosed in this series of 297 cases were organic valvular diseases; the various forms of cardiac arrhythmias, except those, such as sinus arrhythmia, which are not considered as of serious import, but rather as normal variations in rhythm in otherwise normal hearts; and the well known army disease that has been called neurocirculatory asthenia, effort syndrome or cardiac disorder functional. I speak of this as the army disease as the physician in civil life rarely saw it prior to the war, or if he saw it he rarely recognized it. These men were usually aware of their cardiac inferiority and either drifted into work which gave them the least discomfort, often at a sacrifice of income, or else tried to better themselves by the use of advertised remedies, or by the ill-advised regime of severe physical exercise under the tutelage of a strenuous, though ignorant, retired pugilist. The experience in the cardiovascular rehabilitation battalions, while handicapped by many service regulations, was sufficiently encouraging to indicate that in supervised and graduated exercise lies the road to improvement for this type of case.

The value of these observations may be enhanced by the statement that, in the development of this series, 74,130 recruits were examined. Of this number, 6,034 were given cardiovascular examination, and as a result 297 were rejected as unfit for military service. An additional number were found to have murmurs or arrhythmias, considered as not liable to cause disability, and these were accepted for service and records of these are not contained in this report.

The diseases about which the men were questioned included measles, pertussis, scarlet fever, diphtheria, rheumatism, chorea, tonsillitis, growing pains, typhoid fever, dysentery, pneumonia, malaria and syphilis. In this analysis each of these conditions has been considered and in addition there has been added a grouping under the heading of *no history* to include those who denied all of these illnesses as well as the foreigners, from whom it was impossible to elicit the desired information.

In the 297 cases the following diagnoses were made as indicated:

1. The diagnosis of mitral stenosis was made in 35 cases. Measles has occurred in 20 cases; pertussis in 16; scarlet fever in 4; diphtheria in 7; rheumatism in 19; chorea in 3; tonsillitis in 16; growing pains in 9; typhoid fever in 7; dysentery in 2; pneumonia in 5; malaria in 6; syphilis in 3; no history in 5.

2. Mitral insufficiency was diagnosed in 20 cases. Measles had occurred in 15 cases; pertussis in 5; scarlet fever in 3; diphtheria in 1; rheumatism in 7; chorea in 2; tonsillitis in 6; growing pains in 5; dysentery in 2; typhoid fever in 5; pneumonia in 8; syphilis in 5; no history in 2.

3. Aortic insufficiency was found in 10 cases. Measles was found in 2 cases; pertussis in 1; scarlet fever in none; diphtheria in 1; rheumatism in 7; chorea in none; tonsillitis in 2; growing pains in 1; typhoid fever in 1; dysentery in 1; pneumonia in 3; malaria in none; syphilis in 1; no history in 1.

4. Combined valvular lesions were diagnosed in 61 cases. The combinations were found as follows: mitral stenosis and insufficiency in 20 cases; aortic insufficiency and mitral insufficiency in 19 cases; aortic stenosis and insufficiency and mitral insufficiency in 13; aortic stenosis and insufficiency in 3; aortic stenosis and mitral insufficiency in 2; aortic insufficiency and mitral stenosis and insufficiency in 1; aortic stenosis and mitral stenosis and insufficiency in 1; aortic insufficiency and mitral stenosis in 1.

In this group measles occurred in 35 cases; pertussis in 20; scarlet fever in 10; diphtheria in 7; rheumatism in 30; chorea in 4; tonsillitis in 15; growing pains in 6; typhoid fever in 10; dysentery in 3; pneumonia in 7; malaria in 7; syphilis in 4; no history in 10.

5. Tachycardia alone was found in 4 cases. Measles occurred in 2 cases; pertussis in 2; scarlet fever in none; diphtheria in none; rheumatism, chorea, tonsillitis, growing pains, typhoid fever, pneumonia and malaria each occurred once. Syphilis was not present in any case; all the cases gave a history of some antecedent illness.

6. Bradycardia alone was found in 1 case, in which no history of any antecedent illness was obtainable.

7. Auricular fibrillation was diagnosed in 4 cases. Measles, rheumatism and tonsillitis each occurred in 2 cases; pneumonia, malaria and no history were each found in 1 case; pertussis, scarlet fever and diphtheria, growing pains, typhoid fever, dysentery and syphilis were not found in any cases with this diagnosis.

8. Cardiac hypertrophy was the diagnosis in 10 cases, in which no other abnormality could be found. Measles was found in 5; pertussis in 3; scarlet fever in 3; rheumatism in 2; chorea in none; tonsillitis in 4; growing pains in 3; typhoid fever in none; dysentery in 2; pneumonia in 2; malaria in 3; syphilis in 2; no history in 2.

9. Cardiac disorder functional was found in 47 cases. Measles occurred in 29; pertussis in 26; scarlet fever in 8; diphtheria in 8; rheumatism in 16; chorea in 4; tonsillitis in 17; growing pains in 8; dysentery in 6; typhoid fever in 6; pneumonia in 6; malaria in 8; syphilis in 8; no history in 6.

10. Hyperthyroidism was found in 99 cases. Measles occurred in 69; pertussis in 49; scarlet fever in 11; diphtheria in 8; rheumatism in 37; chorea in 2; tonsillitis in 43; growing pains in 34; typhoid fever in 17; dysentery in 16; pneumonia in 19; malaria in 16; syphilis in 18; no history in 13.

11. Aortic syphilis was diagnosed in 4 cases. Measles and tonsillitis were found in 2; pertussis, rheumatism, pneumonia, syphilis and no history were found in 1 case each; scarlet fever, diphtheria, chorea, growing pains, typhoid fever and dysentery were found in no cases.

12. Congenital heart lesion was found diagnosed in 1 case. From the evidence presented it was thought that the lesion was a defect in the intraventricular septum. This case gave a history of having had measles, pertussis, rheumatism, growing pains and typhoid fever.

13. Auricular flutter was diagnosed in 1 case. The history of this showed diphtheria and syphilis.

Analysis of this data shows that the infectious and contagious diseases appeared frequently in the histories of these men. Measles was the disease of greatest incidence in the histories. There were 184 cases of this disease in the 297 cases rejected. This represented 61.6 per cent. of the rejections. Pertussis was the next most frequent condition, 124 giving the history of having had this disease, or 41.75 per cent. of the rejections. Rheumatism followed in 123 histories, or 41.4 per cent. Tonsillitis was the next in order of frequency, being present in the histories of 108 cases or 36.4 per cent. of the rejections. Growing pains was found in 75 cases, or 25.3 per cent. of the rejections. Pneumonia was found in 53 or 17.8 per cent. Typhoid fever was found in 48 or 16.2 per cent. Malaria was found in 46 cases or 15.5 per cent. Syphilis was found in 45 or 15.2 per cent. No history was obtainable in 42 cases or 14.1 per cent. Scarlet fever was found in 38 cases or 12.8 per cent. Diphtheria was found in 35 cases or 11.9 per cent. Dysentery was found in 33 cases or 11.1 per cent. Chorea was the least frequent, being found in only 16 cases or 5.4 per cent.

The consideration of these percentages of incidence is most interesting, as it is not in accord with the popular conception of the relative incidence or cardiovascular disease after infectious illnesses. It is generally believed that heart lesions are very liable to be sequelae of diphtheria, scarlet fever, and chorea as well as in rheumatism, tonsillitis and pneumonia, and they usually believe that certain infections, such as measles, whooping-cough and the like are not liable to be followed by permanent damage to the circulatory system. As a consequence little is done in the presence of these latter conditions to safeguard the heart. The point of great interest lies in the fact that in this series the diseases usually considered as the most dangerous to the circulatory apparatus are among those least frequently found in the histories, while the less severe conditions or those with the milder constitutional reaction lead in the frequency of incidence. This should emphasize the urgent necessity of guarding against circulatory damage by the proper management of all infectious cases.

SUMMARY.

1. In a series of 74,130 examinations of recruits to ascertain their fitness for service in the army, 6,034 were given detailed cardiovascular examination, and 297 were rejected as unfit because of cardiovascular abnormalities.

2. The histories of this last group were taken with special

attention to eliciting accurate information as to the occurrence of measles, pertussis, scarlet fever, diphtheria, rheumatism, chorea, tonsillitis, growing pains, typhoid fever, dysentery, pneumonia, malaria and syphilis.

3. The cardiovascular abnormalities found in the 297 rejected cases were as follows in relation to the frequency of occurrence: hypothyroidism in 99 cases; combined valvular lesions in 61; cardiac disorder functional in 47; mitral stenosis in 35; mitral insufficiency in 20; aortic insufficiency in 10; cardiac hypertrophy in 10; tachycardia, auricular fibrillation and aortic syphilis in 4 each; brachycardia, auricular flutter and congenital cardiac lesion in 1 each.

4. The etiological factors giving rise to these lesions were in their order of frequency of incidence as follows: measles in 61.6 per cent; pertussis in 41.75 per cent; rheumatism in 41.4 per cent.; tonsillitis in 36.4 per cent.; growing pains in 25.3 per cent.; pneumonia in 17.8 per cent.; typhoid fever in 16.2 per cent.; malaria in 15.5 per cent.; syphilis in 15.2 per cent.; no history in 14.1 per cent.; scarlet fever in 12.8 per cent.; diphtheria in 11.9 per cent.; dysentery in 11.1 per cent.; chorea in 5.4 per cent.

5. It is seen that the diseases causing the gravest constitutional symptoms, in this series show a lower incidence of cardiovascular damage than those in which the constitutional reaction is milder, and in which the patients often are never confined to bed or only for a short time. This indicates the danger of damage to the circulatory apparatus following any infectious disease and should emphasize the need of keeping children, ill with these diseases, at rest not only during the period of the acute stage but in the post-acute stage, until the circulatory system has returned to its normal state. While it is to be conceded that all infectious disease can not be robbed of the liability to damage of the cardiovascular system, still the incidence may be considerably lowered by proper attention to prophylactic management.

313 South 18th Street.

END RESULTS OF THE STOFFEL OPERATION IN CASES OF SPASTIC PARALYSIS*

By A. Bruce Gill, M.D.

Professor of Orthopedic Surgery, University of Pennsylvania, Philadelphia.

In cases of spastic paralysis the absence of cerebral control causes the larger and stronger muscles of a limb to overcome their feebler antagonists producing a deformity which at first is functional but which later becomes anatomical.

The deformity is manifested in the upper extremity by flexion of the elbow, the wrist and fingers, and by pronation of the forearm; in the lower extremity, by flexion of the knees, by adduction of the thighs, and by plantar flexion of the feet.

The degree of contracture and disability varies widely. In some cases there is total absence of active motion, in others there is partial motion. Certain patients have almost normal range and power of active motion but experience difficulty in originating motion due to feeble cerebral control. Children, who are affected with spastic paralysis, in the majority of cases, show a greater or less degree of mental deficiency, while a few are idiotic. Some of these patients never learn to walk, some walk with assistance, others walk fairly well but with a scissors gait, and with their heels not touching the ground.

Orthopedic surgeons frequently have considered these backward children as hopeless because of the length of time required in their treatment, and because of the discouraging results which have frequently been obtained. However, some improvement can be secured in practically all who are not idiots, and very marked improvement can be secured in many. Children who have not walked are enabled to do so. Those who have walked but poorly can be made to walk better. In the uppper extremity partial function can be restored, and existing function improved and unsightly deformity removed. These patients, therefore, may be rendered useful members of society, and the burden of their care may be removed from their families and the community.

The objects of operation and treatment are to restore or improve function, to cure unsightly deformity and to relieve painful muscle spasm. Preliminary treatment, by stretching of the shortened muscles and by fixation of the member in plaster splints to relax the over-stretched muscles and to maintain the lengthening of the shortened ones is desirable where the social conditions will permit, and particularly in those cases where no measures have been employed to prevent deformity. This method of treatment will, at times, cause increase of power in the feeble muscles, and will enable the surgeon to estimate how extensive an operation should be performed.

---

*Read before the Philadelphia Pediatric Society, November 8, 1921.

In spastic paralysis the element of spasticity far outshadows that of paralysis. A complete paralysis is rarely present. All muscles are spastic but the strong muscles overcome their weaker antagonists and produce a deformity. These weaker muscles are further weakened by overstretching and by being put in a bad mechanical position. The stronger muscles become more spastic by approximation of their ends. The object of the Stoffel operation is to create a muscular balance of power by reducing the amount of innervation to the stronger muscles and to break in part the vicious circle of the peripheral reflex arc which produces the spasticity. The brain is then able in many cases to reestablish more or less control over the peripheral arc, and to initiate and control motion.

The Stoffel operation consists of the excision of a portion of the nerve supply to the strong and contractured muscle groups in order to produce a partial or complete paralysis of certain of these muscles sufficient to cause a balance between them and their antagonists. It is, therefore, a partial selective neurectomy. The chief element in the operation is the matter of judgment as to how complete a neurectomy should be performed. This is largely a matter of experience and until this experience has been attained, too little should be done rather than too much. It is always possible to return and excise an additional portion of the nerve supply if necessary.

Technic. The nerve is exposed, freed from surrounding tissue, and partially retracted out of the wound. It is then separated into its constituent bundles and these are tested with the electrode. The component parts usually occupy the same relative position in the nerve. Very slight electric stimulation should be employed, as this will cause muscle contraction and avoid the danger of stimulation of contiguous nerve bundles. The nerves which supply certain muscles are then excised in whole or in part, according to the necessity of the case.

Under the anesthetic it is usually found that contractures have disappeared because they were spastic and not atrophic as are those of poliomyelitis. If contracture remains during full anesthesia, tendon lengthening or forcible stretching or tenotomy will be necessary in addition to nerve resection.

If tendon lengthening or stretching has been necessary, the extremity must be placed in a plaster cast in an overstretched position. If this has not been necessary, no method of fixation of the extremity is used. The patient is allowed to move the member as freely as he desires. It is remarkable at times to observe how, on the day following operation, all deformity has disappeared and there is present active motion which was not possible before operation.

Not every case of spastic paralysis is suitable for the application of the Stoffel operation. Those are most suitable in which there is a fixed deformity or in which there is painful muscle spasm, those cases which have a mild deformity which at times disappears but for the most part is present. These may be benefited by an excision of some part of the nerve supply to the flexor muscles. Cases in which the operation is contraindicated are those which have athetosis, marked mental deficiency, severe grades of Little's disease, progressive spinal degeneration in adults. These results apply to both children and adults. It seems likely that certain cases of hemiplegia in adults may be benefited by this operation.

(Dr. Gill demonstrated to the society 7 cases which he had operated upon, showing the improvement which had been obtained in function, comfort and appearance.)

THE DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS OF EARLY HIP-JOINT DISEASE IN CHILDHOOD*

By J. Torrance Rugh, M.D.

Professor of Orthopedic Surgery, Jefferson Medical College, Philadelphia.

Of all inflammatory conditions there is probably none so frequently mistaken by the practitioner as hip-joint disease. There are 2 reasons for error in these cases: the first, failure to make a careful examination, and the second, ignorance of the fundamental symptoms present in the majority of cases.

Prior to 2 years of age, tubercular disease of bones and joints is the exception. The most common age for tuberculosis of the bones and joints is between 2 and about 15 years. The most common site of the infection is in the ends of long bones, where, during this period of life, circulation and growth are most active. One would expect that hyperemia would prove more resistant to a tubercular process. Such is not the case. The most plausible reason is that the great vascularity of these parts renders them more easily injured, establishing the locus minoris resistentiae. Because of the quantity of milk taken during childhood, the danger of tubercular infection is very greatly increased, but with the more careful supervision of the milk supply it has been greatly lessened. The disturbances of nutrition in childhood lower the resistance and render them more suspectible.

The onset is insidious. There is usually a history of a slight injury having occurred within a month, and from which the patient recovered in a few days. There is often also a history of an attack of measles or influenza within a few months before the onset of the disease.

The first symptom is an intermittent limp, noticed in the morning, evening or after active exercise, without pain or other evidence of trouble. There is a certain amount of stiffness and the step of the affected leg is shorter than that of the sound one. This is due to muscle spasm. Nature attempts to immobilize the part by contraction of the surrounding muscles. This is beneficial so far as the ill effects of motion are concerned, but by reason of the pressure it creates aggravates the inflammation in the parts. There will be found a limitation of motion in the joint. In all directions the degree of limitation depends upon the nearness of the disease focus to the joint surfaces. There is no position which is constantly characteristic of the presence of this disease. The position of the leg varies with that assumed by the patient in either standing or lying, and is also influenced by the location of the primary focus of the disease.

---

*Abstract of paper read before the Philadelphia Pediatric Society, November 8, 1921.

A symptom which is inseparable from the early onset of the condition is muscle atrophy. This is more profound in this type of infection than in any other inflammatory process, and furthermore, permanent to a greater or less degree. This occurs within the first week of the onset and is due to disuse, spasm, and the direct effect of toxins upon the trophic nerve cells. Careful measurement shows apparent lengthening or shortening, due to the position of the leg. If in abduction, there will be apparent lengthening. If in adduction, there will be apparent shortening by alteration in the angle between the femur and the pelvis.

Pain is a late manifestation of the disease and is most commonly felt on the inner side of the thigh and knee, along the distribution of the obturator nerve. It is very uncommon to have pain in the hip joint. Night cries occur after other symptoms are well marked, and are due to movement of the joint during sleep. The sudden contraction of the muscles as the child wakes causes a sudden sharp pain and the child wakes with a cry. There is slight elevation of temperature. If it reaches 102° or above, it is almost diagnostic of some other type of infection.

The x-rays are of infinitely less importance than the clinical examination. Absorption of bone substance is the typical picture; there may be found a wider space between the surface of the head and the acetabulum because of fluid in the joint; also roughening of the surface of the cartilage of the head or of the acetabulum.

One point in the examination is the custom of many physicians to tap on the sole of the foot to elicit pain in the hip joint. This procedure cannot be too strongly condemned. It shows nothing which cannot be determined by careful manipulation, and may do damage to the hip joint. Because of the danger of breaking down parts already weakened, it should never be employed.

The most common error in diagnosis concerns rheumatism. This is easily differentiated. It is polyarticular; more acute; not very common in childhood; more painful from the beginning, and runs its course in from 1 to 3 weeks, especially under the influence of the salicylates. If there is doubt, the child should be kept at rest, and given a therapeutic test. If at the end of 2 or 3 weeks, the temperature has not dropped to normal and there is not free function in the joint, it should be treated as the more serious condition.

Acute synovitis is easily differentiated by the sudden and rapid onset following an injury or acute infection. The entire condition is acute and quickly subsides. In certain cases, the acute process may become chronic synovitis. The differentiation from tuberculosis then becomes almost impossible, and the case must be treated as though tubercular.

Another condition is limitation of function from irritation of the genitalia, such as phimosis, vaginitis or adhesions between the hood and the clitoris. Usually the hip involvement is not constant. One hip may be affected for a short period and later the other becomes involved.

Acute infection of the epiphysis, such as occurs after acute injuries or during the course of acute processes, is easily differentiated by the severity of the symptoms. Pus forms early, the abscess is acute and requires prompt surgical treatment.

Acute rickets is often accompanied by extreme pain in one or many joints and occurs most frequently prior to 2 years. The pain is in more than one joint; the change of food with the administration of hypophosphites and fats will clear up the case in a week's time.

Infantile scurvy is much the same. In advanced cases the x-ray will show extensive hemorrhages under the periosteum. The condition of the gums, and, in severe cases, petechial hemorrhages help to confirm the diagnosis.

Contraction of the psoas muscle from disease in the dorsolumbar or lumbar spine, even from the presence of an appendiceal abscess, may prove confusing. The leg is held in a position of flexion and cannot be straightened. By still further flexing the leg and then testing the movements of the joint, the joint will be found entirely free in complete flexion, while in hip-joint disease further flexion will not be possible.

Always bear in mind the well known injunction, "In every case of painful hip, examine the spine, and in every case of painful knee, examine the hip."

Sometimes presenting difficulty in diagnosis is coxa vara. These patients develop a limp, usually without injury, pain or other disability. Examination shows no atrophy and limitation only in abduction. The x-ray is of great value, and will show the alteration in the angle of the neck with softening of the head and neck of the femur. This is not seen in tuberculosis. The condition requires treatment similar to that of the tubercular infection.

TREATMENT OF ACUTE GASTROENTERITIS IN INFANCY (La Pediatria Española, Dec. 20, 1920). S. C. Gutierrez is against the administration of purgatives, such as castor oil, in either the acute or the chronic form of gastroenteritis in infants. Rectal irrigations, first employed by Monti, have been almost given up by the writer, their sole indications being rectal tenesmus or the necessity for the rectal administration of opium. Hydrotherapy, in the form of sponge or full bath, is sometimes of value, as are also hot compresses. Intestinal antiseptics have also fallen into disuse, not so much, in Gutierrez's opinion, on account of their somewhat exaggerated danger, but mainly because of their failure to help the little patient. The best method of intestinal antisepsis is to put the intestinal mucosa in a condition where it will regain its normal resistance against invading bacteria. As to astringents, they are of service when the occasion is opportune and the dose correct. Any astringent may increase toxemia if it is given in the active acute stage; it must always be merely an adjuvant to a dietetic regimen, and only in the rarest instances can it, *per se*, cure diarrhea. Bismuth subnitrate, dermatol, tannin, tannigen, oxide of zinc, gelatin and many other agents give good results when used propitiously as to time and dose, but their action can never be compared to that of opium. The diet is to be watched with the utmost care and increased with the greatest caution, and, later on in convalescence, the administration of tonics is indicated.—*New York Medical Journal.*

PROGRESS IN BONE AND SURGICAL TUBERCULOSIS.*

By DeForest P. Willard, M.D.

Philadelphia

The study of bone and joint tuberculosis is of peculiar interest to the physician who specializes in the diseases of childhood. Fortunately the medical profession is becoming more and more alive to the necessity of early recognition of tubercular lesions and the orthopedic clinics are receiving fewer of those advanced cases which can never be fully restored to good physical function.

A factor which has unquestionably diminished the number of cases of bone and joint tuberculosis in this and other large centers of population is the supervision and consequent betterment of the milk supply. It is now fairly well accepted that many cases of bone and joint tuberculosis are caused by the bovine type of bacillus and that the main portal of entry to the body is by way of the ingested milk. As it is the medical man on whom the responsibility of making the accurate diagnosis usually falls, to him, therefore, must be emphasized the necessity of early diagnosis or diagnosis in the pre-deformity stage. If this is made before joint destruction occurs, proper treatment gives every chance of obtaining a useful functioning joint.

In early diagnosis, the x-ray is of little value as it is only after considerable bony destruction has occurred that the x-ray reveals the lesion. Careful physical examination for signs of muscle spasm, muscle atrophy, limitation of joint motions, and joint tenderness, with or without joint pain, will give the clue to the condition long before the x-ray can show it. It is far better to start suitable treatment early than to wait until the diagnosis is absolutely assured.

The laboratory may also aid in early diagnosis. The Pirquet test is fairly reliable in children. The subcutaneous injection of tuberculin (Koch) is, perhaps, even better if the child's temperature can be watched before and after the injection.

Pathology. Bone tuberculosis is not purely destructive; proliferative changes may occur also during the disease. When cancellous bone is involved, destruction predominates. When compact bone is involved, proliferation predominates. It is most frequently localized in the ends of the bones and consequently involves joint structures.

---

*Abstract of paper read before the Philadelphia Pediatric Society, November 8, 1921.

Treatment. Fixation is still of the greatest importance. Weight bearing must be stopped; the affected joint, and those adjacent to it, must be immobilized. Operative methods of fixation are valuable. The Hibbs and Albee spinal fixations are of especial value in adult cases. In children they are not to be considered as a cure in themselves and must be followed by a continuance of conservative treatment until the disease is quiescent. In hip tuberculosis, Maragliano hastens repair by driving an osteoperiosteal graft through the trochanter, neck and head of the femur to the acetabulum.

Heliotherapy. This is of undoubted value. Pigmentation of the skin without actual burning is done by short preliminary exposures to direct sunlight which are gradually lengthened. Lovett believes the treatment can be shortened and the therapeutic effect concentrated by the use of a double convex lens concentrating the rays, this being known as the Thezac-Porsmeur method.

Authors have reported favorable results from the so-called coal-arc light. Ernst has obtained unusually good results in tuberculosis of the soft parts and more superficial joints, the deeper joints not responding as well. He believes this light much superior to the mercury lamp in penetration and in the skin pigmentation produced.

X-ray therapy is being brought prominently forward. Emphasis is laid on the need of heavy aluminum filters to prevent skin burns. They state the tuberculous tissues are melted out and separated from the surrounding tissues by a granular wall. The cavities can be drained and radiation begun in 2 or 3 days, repeated every week or two.

Tuberculin has been both advocated and condemned. It is not a cure for tuberculosis. I would go even further and say that it is not even an aid in treatment. Autogenous vaccines may cut down infection and the toxemia, but are better given alone than with tuberculin.

The treatment of bone tuberculosis is being directed along the lines of restoration of function rather than of mere inhibition of the disease process. Progress lies in education of the medical world to recognize the disease in its early and curable stage. Early diagnosis makes for early treatment and successful restoration of function.

SUPPURATIVE NEPHRITIS IN CHILDREN.*

By Edward L. Bauer, M.D.

Philadelphia.

Surgical conditions of the kidney in the young child offer a fertile field for investigation and study. Not the least of these conditions is suppurative nephritis. From the standpoint of its pathology, etiology and treatment, either medical or surgical, it offers food for much discussion and an opportunity for extensive experimental work. The paucity of clinical material makes study difficult, but none the less necessary, because of the importance of many differential diagnostic points, and the gravity of the prognosis that is usually involved.

Unfortunately bilateral infection of the kidney is all too common compared with the unilateral variety; nevertheless, the latter can and does occur. Infections of the kidney can take place through 3 possible channels—through the circulation, the lymph channels, and from the bladder through the ureters. Realizing this, it is hard to see just why one kidney should be spared. In some instances, particularly where the whole kidney is destroyed, it is quite likely that the mode of infection cannot be decided. The type due to vascular infections is recognized by the multiple abscesses of pyemia.

We will forego a discussion of the embolic type. The vascular channel of infection has been produced experimentally and is under those circumstances, generally bilateral. However, Reimann[1] quoting Brewer states that traumatizing one kidney previous to the injection of the bacteria will produce a unilateral kidney suppuration. It is not clearly understood, however, just why one kidney should escape at any time except in those cases of clearly demonstrated trauma or why particularly in these circulatory infections there should be in one case a large single abscess and in another case many small abscesses. The virulence of the infecting organism may have something to do with this as it seems to have in the degree and extent of kidney tissue destruction. One of the commonest organisms causing pyonephrosis is the bacillus coli. These organisms may invade the kidney through the blood stream, through the ureter from the bladder, and through the lymph channels running along the course of the ureters. Reimann points out that these channels of infection are logical and probably frequent in childhood, and further it has been proved experimentally in animals.

---

* Read before the Philadelphia Pediatric Society, February 14, 1922.

As a predisposing cause, hydronephrosis, which in turn is generally caused by some obstruction in the urinary tract, provides a fertile field for an infection of this kind. Thomson[2] classifies these hydronephroses in young children as bilateral or congenital and unilateral or acquired. Pfaundler and Schlossmann[3] are inclined to accept this rough classification. It is then in the acquired or unilateral hydronephrosis with a complicating infection that we are most likely to get a unilateral pyonephrosis. Since hydronephrosis does not necessarily precede suppurative nephritis, even in the unilateral cases, there must be other cryptic factors involved. This does indeed leave a wide field for investigation. From the clinical standpoint, the bilateral cases present the symptoms of toxemia, then pyemia and can be recognized only by the recovery of the organism of the urine. The diagnosis is more frequently made, however, at the autopsy table. The unilateral type presents the general picture of a septic infection, pus in the urine, usually an infecting organism and more particularly early in the attack, attacks of pain and localized tenderness over the kidney area and possibly, but not necessarily, a mass in the lumbar region. Cystoscopy is a great aid in determining whether one or both kidneys are affected, and the x-ray may, but not necessarily, present a shadow.

The treatment in recognized bilateral suppurative nephritis is of course supportive and should include the salient features of the best methods for meeting an acute nephritis in young childhood.

The consensus of opinion among genitourinary men seems to be opposed to vaccine treatment, stating that the results have been disappointing.

The unilateral type of case is best treated surgically, particularly if the patient is in fair condition, is not showing any rapid improvement under medical treatment, and we are certain of good function in the remaining kidney. Children stand the operation of nephrectomy very well. The differential diagnosis between unilateral suppurative nephritis and stone in the ureter, tuberculosis of the kidney, hypernephroma, sarcoma of the kidney, perinephric abscess, acute appendicitis, if right sided, ovarian cysts, retroperitoneal sarcoma, kidney stone, lumbar Potts' disease, or coxalgia must be made. To that end the location of pain, tenderness, palpation of possible masses, whether they are fluctuating or non-fluctuating, a careful examination of the urine, presence or absence of pus, blood or bacteria, not forgetting too, the tubercle bacilli, x-ray examination, and the cystoscopic examination, including the color functional test.

The following case brought this whole subject to my attention most emphatically.

G. W., a boy, aged 4 years and 11 months, was referred to me by Dr. Valentine Miller with a history of having had frequent attacks of paroxysmal pain in the right lumbar region. These attacks had been more frequent and severe during the last 4 months prior to my seeing the child, although he had had them off and on since infancy. The attacks were so severe that heroic drugs were necessary to give relief. They were accompanied or followed by a profuse pus discharge in the urine, sufficient to have impressed itself upon the child's parents. His previous history states that he had had mumps when 3 years of age, and when 2 years old had had an influenzal pneumonia followed by a staphylococcic skin infection. Six weeks prior to my first visit, he had had his appendix removed. When I first saw the child, he had a temperature of 102°, pulse 140, respirations 44. He appeared to be septic. It was evident that he was suffering intense pain. His right rectus was rigid, he had pain in his right lumbar region and along the course of the right ureter, the right testicle was drawn up and his right thigh flexed upon the abdomen. A very soft mass could be indistinctly felt in the right lumbar region when the child was under the influence of codein. His urine at this time, strange to say, was perfectly clear, but later in the day, as the attack wore off, it was heavily laden with a thick pus. This urine of course contained albumen, and subsequent examinations, as well as this one, failed to show any blood. His blood count showed hemoglobin 60 per cent.; red blood cells, 3,220.000; white blood cells, 12,600; polymorphonuclear, 78 per cent.; mononuclear, 22 per cent. His von Pirquet was negative. Twenty-four hour specimens centrifugalized and the antiforminized sediment injected in the guinea pig failed to show tubercle bacilli. Cystoscopic examination was made by Dr. W. H. MacKinney and the following report was submitted: "The bladder showed generalized cystitis with considerable retained pus. Indigo carmine was excreted through the left ureter in 4 minutes. None ever appeared from the right ureter. The right ureter exuded pus profusely." A straight naso-pharygoscope, size 10-11 F, was used and therefore ureteral catheterization was impossible and indeed unnecessary. X-ray examination showed no masses or calculi.

Dr. Harry C. Deaver removed the kidney through a right posterior incision that promptly healed. Pathological report of specimen was as follows: "A kidney measuring 10x4x3 cm., showing lobulations; cut section shows many confluent cysts communicating with the pelvis of the kidney. Kidney architecture practically destroyed." Pathologic diagnosis made by Dr. S. P. Reimann is as follows: "A non-specific suppurative pyelonephritis." No organism was recovered from the specimen or the urine prior to operation. The child made a speedy recovery, has gained in weight and its last urine report shows nothing abnormal.

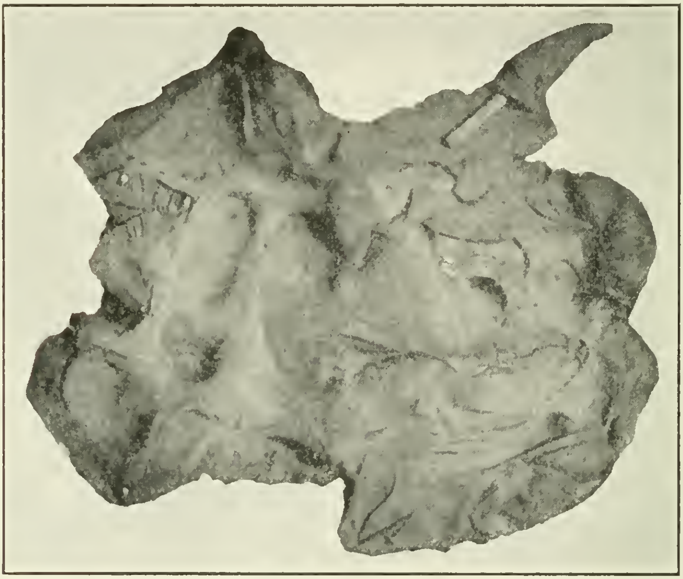


FIG. 1. Acute suppurative pyelonephritis—patient G. W. Note numerous cysts destroying kidney architecture.

This case is interesting because of its comparative rarity in type, the fact that cystoscopy played such an important part in our deductions and that the child has made a complete recovery. However, it has not given us any definite information as to the cause or method of infection, nor has it given us any clue as to why one kidney should be selected for destruction.

It is evident that the study of cases with pus in the urine, with or without general or local symptoms, deserves the most careful medical and urological investigation. The etiology, symptomatology and treatment are all still the subject of much conjecture and it is hoped that the cystoscope will aid in further clearing up these points, as well as other new diagnostic means at our disposal.

6112 Germantown Avenue.

BIBLIOGRAPHY.

1. Reimann, S. P.: Surgical Pathology. *In press.*
2. Thomson, J.: Clinical Studies and Treatment of Sick Children.
3. Pfaudler and Schlossmann: Diseases of Children.

LETHARGIC ENCEPHALITIS (Médecine, Paris, Dec. 1920). In the course of this survey of the epidemic of encephalitis in France, H. Roger emphasizes the way in which cases are scattered. Although it is estimated that there have been 10,000 cases in France, yet nowhere has there been a true epidemic; the cases occur in distant quarters, without its being possible, usually, to distinguish any link between the persons affected. In only 174 cases could direct contagion be determined, but Netter comments that direct contact in cases of epidemic meningitis is no more frequent than this. One child of 3 developed the encephalitis after a visit to a country town where there had been cases of the disease, before any had been known in Paris. After its return to Paris, a 6 year old child and a 5 month infant, who slept in the same room, developed the same set of symptoms. In a family reported by Lévy, three children presented in turn the different types of encephalitis. An epidemic has been reported in an institution in England where twelve of the twenty-one inmates were affected and four died, a mortality of 19 per cent. with 57 per cent. morbidity. Contagion may possibly occur from the unrecognized visceral forms, or from healthy carriers. The incubation is generally regarded as very long, from one or two or several months. In one of Netter's cases there was an interval of eleven months between the appearance of the disease in the two sisters. Relative isolation should be enforced, and disinfection of the mouth, nose and throat.

—*Journal A.M.A.*

DEPARTMENT OF ABSTRACTS

Conducted by

Wm. Henry Donnelly, M.D., Brooklyn, N. Y.

Kaiser, Albert D.: Effect of Tonsillectomy on Twelve Hundred Children. (American Journal of Diseases of Children, February, 1922, p. 139.)

Kaiser found that among this number of children operated upon for diseased tonsils and adenoids there was 34 per cent. malnutrition to the extent of 7 per cent. or more underweight; re-examination, 9 to 12 months later, showed a reduction of malnutrition to 15.9 per cent. of the cases. Diseased tonsils do not necessarily impair nutrition as is evidenced by the fact that 66 per cent. of these children showed a normal weight for height. However, diseased tonsils and adenoids are undoubtedly a factor in malnutrition as evidenced by the marked improvement in 219 children of the group, after operation. W. H. D.

Denzer, B. S.: Diagnosis of Peritonitis and Peritoneal Transudates in Infants by Means of Abdominal Puncture with the Capillary Tube. (American Journal of the Medical Sciences, February, 1922, p. 237.)

Five cases are reported of diagnosis of peritonitis with the capillary tube; further, fluid was found by this method in 7 out of 12 cases of marasmus, and in 4 of 8 cases of rickets. The finding of fluid in the peritoneal cavity in marasmus and rickets, has, as far as Denzer can determine, not been previously recorded. The most satisfactory apparatus is that of trocar-canula and glass capillary tubing and the procedure is as follows: After sterilization of the skin and the usual precautions to determine bladder distention, the point of the trocar-canula is thrust through the skin and into the peritoneal cavity. The trocar is withdrawn and the glass capillary tube inserted as far as it will go. As a rule the mid-line below the umbilicus is the site chosen although punctures have been done in the iliac fossae.

W. H. D.

SCHORER, EDWIN H.: VOMITING IN INFANTS AND CHILDREN. (Journal of the Missouri State Medical Association, February, 1922, p. 72.)

The writer places vomiting in 8 classes or groups. The first class is that of stomach conditions, namely, overloading, eructation of gas or swallowed air, gastric indigestion. The second is that of obstruction at the pylorus, either spasm or stenosis. The third is the reflex class, including psychic voluntary vomiting, that due to coughing, masturbation or worms. The fourth group is that of emesis in the onset of acute febrile diseases, and as it is usually due to acidosis, it is relieved by correcting the acidosis. Nervous system conditions comprise the next class, involving meningeal irritation or cyclic vomiting. The sixth class is the intestinal class and includes vomiting due to intestinal obstruction, peritonitis, appendicitis and malformations of the intestinal tract. In the seventh group blood conditions are the etiological factors such as melena of the new-born, toxic substances in the blood, as in uremia, and nephritis. The last class is that of ulcer of the stomach in the new-born, acute gastritis, and tubercular ulcers. Every attempt should be made to diagnose the cause of the vomiting before changing the diet.

W. H. D.

MILLS, H. BROOKER: REDUCTION OF TEMPERATURE IN CHILDREN WITHOUT THE AID OF DRUGS. (Therapeutic Gazette, February 15, 1922, p. 88.)

Antipyretic measures advocated are the application of the ice cap alternate hours from 7 a. m. to 7 p. m., a hot water bag to the feet, and tepid sponging, if the fever reaches 102°. If, in spite of these measures, the temperature rises to 104° colonic irrigations are substituted for the sponging, using either normal saline or 5 per cent. soda bicarbonate solution. Attention is drawn to the fact that it is neither necessary nor advisable to pass the rectal tube into the bowel more than 4 to 6 inches and only a single tube at that. Admission of fresh cold air, without drafts, to the sick-room will also help to reduce fever; packs are little employed by the writer. W. H. D.

PIRQUET, CLEMENS: NUTRITIONAL TREATMENT OF TUBERCULOSIS. (New York Medical Journal, February 1, 1922, p. 121.)

Pirquet states that his first step is to give the patient the skin test and have an x-ray examination made. Then a food prescription is made out based on the sitting height and the percentage underweight for height, observing a minimum of 10 per cent. and a maximum of 20 per cent. of protein. The feeding cure is combined with a rest cure, the child being left in bed on a porch, in a garden, or on a roof garden for the first 2 weeks, then allowed to get up for a half hour morning and afternoon for the next week, and so gradually longer out of bed each week. The weight is taken weekly and the food ration increased if the gain is not satisfactory. Children are seated at table according to the class to which they belong for their nutritional requirements, the food being served with a graduated dipper for liquids and a scale for solids, with bread and cake sliced in hektonem portions for convenience. Care is taken to give the children simple food which they will be able to obtain at home, and not accustom them to a rich and fancy diet which will spoil them for plain food when they leave the hospital. W. H. D.

APFEL, HARRY: THE FEEDING METHOD OF THE PIRQUET SCHOOL. (New York Medical Journal, February 1, 1922, p. 123.)

Apfel states that Pirquet has laid down certain fundamental principles, carefully worked out, which must be followed to intelligently employ his feeding system. The first is that whatever food we utilize, we must compare its nutritive value with that of mother's milk, the basic food. The unit of food value is called the "*nem*" and represents the equivalent of one cubic centimeter of mother's milk. The second principle is that the 24-hour ration of required food is in exact proportion to the square surface of the intestinal tract. This square surface is estimated from the sitting height of the patient, which measurement squared gives the required surface area of the intestinal canal. Between 5 and 10 decinems for each square centimeter of the intestinal surface has been named as the optimum scale by Pirquet. That the prescribed food shall contain at least 10 and not more than 20 per cent. of protein is the only restriction made as to the kind of food used, always using one gram of mother's milk (or one "*nem*") as the standard of measurement. Schick, working with Pirquet, has introduced the feeding of high sugar percentages in either breast or cow's milk to premature and new-born infants, starting with 17 per cent. cane sugar, and feeding according to the square of the sitting height. This principle of small concentrated feedings has been successful in pylorospasm, severe vomiting and even scurvy. W. H. D.

LEWIS, MILTON S.: PERICARDITIC PSEUDOPNEUMONIA IN CHILDREN. (Medical Record, February 25, 1922, p. 327.)

Lewis draws attention to the existence of a patch of dulness with bronchial breathing and bronchophony at the angle of the left scapula in pericarditis. This often results in a false diagnosis of pneumonia. Three theories have been advanced as to the cause of this phenomenon: (1) a distended pericardial sac pressing on the lung producing a mechanical atelectasis; (2) an inflammatory process extends from the pericardium to the pleura or lung causing changes responsible for the physical signs in the lung; (3) pressure is exerted on the lung by a dilated heart or a pleural effusion. The writer's opinion is that the cause is pressure by the heart or pericardium or both. W. H. D.

THOMSON, JOHN: BACILLUS COLI INFECTION OF THE URINARY TRACT IN INFANTS. (Glasgow Medical Journal, February, 1922, p. 82).

The origin of the infection is generally in the patient's bowel and predisposing conditions must exist as lowered resistance of the tissues, retardation of the flow of urine downward, or an increased virulence of the colon bacilli. A history of severe diarrhea is very common. There are 3 modes of entrance of organisms into the urinary tract: (1) by the blood stream; (2) directly through the tissues; (3) by an ascending infection passing up the urethra from without. In about half the cases in girls a rise in temperature is accompanied by rigors or shiverings—a rare symptom in childhood and one which should always draw attention to the urinary tract. Treatment consists of giving plenty of water either by mouth or rectum, keeping the bowels open and the employment of one of 3 measures—the use of sera or vaccines, the administration of antiseptics, or the alkalinization of the urine. Of these, Thomson prefers the last, giving usually citrate of potash beginning with 60 to 100 grains per day, increasing, if necessary, to 120 or 180 grains. If the dose is too small, or if the disease has spread to the kidneys to any serious extent, the alkaline treatment has little effect; the same is true where there is a mixed infection. In mixed infection, the alkaline method may be alternated with urotropin, but when used alone it may do nothing but harm. W. H. D.

GORDON, MURRAY B. and BELL, A. L. LOOMIS: ROENTGENOGRAPHIC STUDY OF THE SELLA TURCICA IN NORMAL CHILDREN. (New York State Journal of Medicine, February, 1922, p. 54.)

One hundred and four normal children, aged from 1 to 12 years, were x-rayed in this investigation with the following results: the size of the sella varies considerably as to both height and length for a given age; the shape of the sella is of no significance except that the shallow type is found in small heads and limited to the first 3 years of life; there is no relationship between the size of the sella and the measurements of the head, nor any difference between boys and girls as to shape of the sella although the average measurements were greater in girls.

W. H. D.

DONNELLY, WILLIAM HENRY: PREVENTION AND TREATMENT OF UNDERNOURISHMENT IN CHILDHOOD. (New York State Journal of Medicine, February, 1922, p. 59.)

Prevention of malnutrition should begin with ante-natal care and instruction of the mother, not only as to organic disease but also as to the inclusion in her diet of the vitamines essential to the welfare of her unborn child. The same is true of the nursing mother and her diet; supplemental feedings for infants should be sufficient in calories as well as vitamines. In older children, the diet should be sufficient in bulk, calories and vitamines; the tonsils should be removed if diseased; dental and postural defects should be corrected; organic diseases should be treated. Then rest in bed from 7 p. m. to 7 a. m., sufficient time at meals, a rest period during the day with an after-school lunch, the drinking of 1 quart of milk, preferably raw, each day will give surprisingly good results. W. H. D.

SHEFFIELD, HERMAN B.: DIPHTHERITIC AND POSTDIPHTERITIC PARALYSIS. (Medical Record, March 4, 1922, p. 362.)

Sheffield believes that active treatment of the throat locally will do much to prevent the onset of paralysis and to destroy the toxic products at their source. For this purpose he advises:

Phenolis ½ drachm
Resorcin ½ drachm
Pulv. camph. gr. 15
Alcohol 4 drachms
Glycerin q.s. ad 3 ounces.

The throat is swabbed with this every 3 to 6 hours, and at the same time the nose is thoroughly cleansed with warm boric acid or Dobell's solution. Not only does the writer believe that strychnine is effective in the actual treatment of the neuritis, but also that, administered early, it is an effectual preventive of the paralysis. It should be given hypodermatically in severe cases, otherwise by mouth, in doses of 1/60 grain, 3 times a day. Notwithstanding the opinion of some clinicians, Sheffield has had considerable success from the exhibition of small doses of digitalis for cardiac arrhythmia in these cases. W. H. D.

THOMAS, GILBERT J. AND TANNER, CHESTER O.: URINARY LITHIASIS IN CHILDREN. (Minnesota Medicine, March, 1922, p. 147.)

The writers, from a study of 203 reports of cases, are unable to determine the etiology of the stones, but infection is one of the factors. The symptomatology in order of occurrence is as follows: pain and colic; hematuria; frequency of urination, pyuria, dysuria, nausea and vomiting. Diagnosis was made by x-ray in

55 per cent.; by urinalysis in 52 per cent.; by cystoscopy in 33 per cent.; clinical findings alone in 11 per cent. Cystoscopic examination may be made in very young infants; the infant's ureter is proportionately large and capable of great distention so that 69 per cent. of stones were found in the bladder, of which a large number had their origin in the kidney. Surgery is indicated when the stones do not progress through the urinary tract. Urinary stone may remain symptomless in children for years, and stones discovered in adult life may have their beginning in infancy or childhood. W. H. D.

LAUZE, M.: TREATMENT OF INTOLERANCE OF MOTHER'S MILK BY ITS INJECTION SUBCUTANEOUSLY. (Bulletin de la Societe de Pediatrie de Paris, Oct., Nov. Dec., 1921, p. 257.)

This was a case of insomnia, continuous crying much worse at nursing time, great agitation, failure to gain in weight. One subcutaneous injection of 10 c.c. of the mother's milk gave instant and lasting relief from all symptoms with rapid gain in weight. W. H. D.

SHANNON, W. RAY: ANAPHYLAXIS TO FOOD PROTEINS IN BREAST FED INFANTS. (Minnesota Medicine, March, 1922, p. 138.)

Shannon did 254 tests on 14 patients with 80 positive results. He confirms O'Keefe's work in that the mothers were not sensitive to the foods to which the infants reacted. He believes that veal and egg protein may appear in the breast milk after their ingestion by nursing mothers, and that there is strong evidence that the same may be true at times of almost any food. Colic, vomiting, diarrhea, repeated respiratory infections, milk crust, seborrhea and eczema in breast fed infants are often the result of allergic reactions to food coming to the infant through the breast milk. In cutaneous tests the erythematous reaction is more important than the wheal and also more common. Repeated exacerbations of eczema in breast fed babies may be due to newly acquired sensitization to foods the mother eats.

W. H. D.

SPENCE, RALPH C.: INFECTIOUS DIARRHEA IN YOUNG CHILDREN. (Southern Medical Journal, March, 1922, p. 189.)

Spence believes that cases of acute diarrhea in infants and young children, whose onset is sudden, with fever and prostration and whose stool shows blood and mucus over a period of several days, are due to one of the two groups of the dysentery bacillus. Those cases, whose stools do not show blood or mucus, are probably not due to dysentery bacilli. Inasmuch as the bacilli are at once killed by acid environment a diet high in carbohydrate, especially malt sugars, is indicated. Immune horse serum is now available and, as soon as the diagnosis is made and a stool culture taken, this serum should be administered. A polyvalent serum, made up of equal parts of both the Shiga and the Flexner type serum, is given subcutaneously, the average dose for a child of 3 years being from 10 to 30 c.c. repeated daily until improvement sets in. After the bacteriological report has identified the type of the bacillus, then the serum given is the monovalent serum for that type. The dysentery bacilli are transmitted from the stools as in typhoid fever and the same precautions should be observed as in typhoid. The stool cultures are taken through a proctoscope with a 12 inch glass tube containing a swab on a stiff wire; the swab is withdrawn into the tube, and, later, melted agar is inoculated and plated. W. H. D.

O'KEEFE, E. S.: DIETARY CONSIDERATION OF ECZEMA IN YOUNGER CHILDREN. (Journal of A.M.A., February 18, 1922, p. 483.)

Some rather surprising facts were discovered by O'Keefe in his investigations. More than 60 per cent. of breast fed infants with eczema showed protein sensitization by skin tests; in no case was there sensitization to human milk, nor did any mother show a skin reaction to the protein to which her child responded. Forty per cent. of the infants showed a positive reaction to egg proteins, 39 per cent. to cow's milk, 5 per cent. to oat, and 2 per cent. to wheat. Elmination of the food involved from the mother's diet gave apparent cure in 40 per cent. of the cases, and definite improvement in 20 per cent. more, a grand total of 60 per cent. W. H. D.

Costello, Jos. P.: Importance of Ophthalmoscopic Examination in Children. (Journal of the Missouri State Medical Association, March, 1922, p. 118.)

The technic varies from that used in adults as there can be little or no cooperation from the child. One hour before the examination, the pupils are dilated with one drop of a 0.25 per cent. solution of atropin, and during the examination no attempt is made to have the child fix his gaze on a given object but rather the examiner fixes his own attention on the retina and as the child rolls his eyes the optic disc will come into position. This examination in itself is pathognomic in a disease as amaurotic family idiocy, and helps in the dignosis of lues, tuberculosis, meningitis, brain abscess, tumors and blood diseases. W. H. D.

Emerson, Paul W.: Collection and Preservation of Human Milk. (Journal of A.M.A., March 4, 1922, p. 641.)

Human milk is so valuable a food in infant feeding, especially for weak babies that lose weight on artificial formulæ, that means are being attempted for its preservation. For short periods of time, human milk may be preserved by having it put directly into sterile bottles, pasteurizing it and keeping it on ice. The success of drying cow's milk brings up the question of doing likewise with mother's milk, and experimental work is being done at the On-shore Department of the Boston Floating Hospital along this line. Two other methods of preserving mother's milk were considered, namely, one, its evaporation and preservation with sugar in the same way as cow's milk is "condensed"; the other, of preserving the fat alone. The latter proved to be the more practical, and a 12 per cent. human milk fat was prepared, and by combining this with cow's skim milk and lactose a milk was obtained which had a formula: fat 3 per cent., sugar 7 per cent., protein 1 per cent. This has stood a clinical test, and it only remains to be seen how long such a condensed milk fat will keep. The conclusions are that human fat can be preserved at least a month. When it is combined with cow's skim milk and fed to a baby for a short period of time we may expect a gain in weight equal to that obtained with whole breast milk. This milk might be used in children with an intolerance for cow's milk, but it is expensive and difficult to prepare. Drying of human milk is more feasible and much less expensive. W. H. D.

DAVIDSOHN, E.: INDICATIONS AND TECHNIC OF FEEDING WITH PROTEIN MILK. (Archivos Latino-Americanos de Pediatria, January, 1922, p. 2.)

Davidsohn is a pediatrician in Berlin who wrote this article for this South American publication and it gives the indications as followed in Germany. These indications are: (1) disturbances of nutrition accompanied by diarrhea in artificially fed children; (2), feeding of the new-born, especially in institutions where a large number of children are to be artificially fed; (3), infections of the gastrointestinal tract as dysentery and enterocolitis. The preparation of the protein milk is entrusted to a special laboratory which dispenses it in containers of 350 grammes. The composition of the protein milk is casein 2.7 per cent., fat 2.3 per cent., salts .5 per cent., lactose 1.4 per cent., and its caloric value is 400 per litre. W. H. D.

MARCUS, JOSEPH H.: CORYZA IN INFANCY AND CHILDHOOD. (Medical Record, March 18, 1922, p. 455.)

Young children with coryza should be kept in a well ventilated room at a temperature of 68°; the quantity of food, especially in infants, should be reduced. Adrenalin solution 1-1000 may be dropped into the nostrils if there be much nasal blocking, and a lanolin ointment may be applied to the upper lip to prevent excoriation. Mentholized steam is valuable as an inhalation; belladonna internally is useful in lessening the nasal secretion; in throat involvement, 2 or 3 minims of tincture of iron chloride in glycerin may be given every 3 hours. Prophylaxis is important, and here hygiene is of great importance; children should be encouraged to go outdoors daily; their rooms should be well ventilated at a temperature of 68°; adenoids should be removed when present, as they predispose to colds.

W. H. D.

SPANO, ROCCO: TREATMENT OF VINCENT'S AGINA WITH NEOSALVARSAN. (La Pediatria, March 15, 1922, p. 241.)

From the results obtained in 14 cases, this treatment would seem to be by far the best for this condition. After the first intravenous injection of the drug, there was sloughing off of necrotic detritus followed by a rapid process of granulation. This was soon followed by a diminution in the glandular swelling, a lessening of the fetor and an improvement in the appetite. Three or 4 injections of small doses were sufficient at intervals of 2 or 3 days and there was absolutely no untoward after-effect. The dosage was from 5 to 10 centigrammes, according to the age of the child. Spano then concludes that the treatment by intravenous injections of neosalvarsan is one of rapid action, dependable results, and safety. W. H. D.

NOBECOURT, PROF.: NEGATIVE TUBERCULIN SKIN REACTIONS IN RESPIRATORY DISEASES IN CHILDREN. (La Pathologie Infantile, March, 1922, p. 33.)

The writer believes that a negative tuberculin skin reaction does not exclude infection with the bacillus of Koch. It may be in the pre-allergic stage, especially if the child be a nursing baby; it may be in a state of anergy from a grave tuberculosis, measles, grippe or typhoid, pneumonia or a hepatic insufficiency. Therefore, though tuberculous, the child may give negative skin tests. However, eliminating the above factors, a series of negative tests permits the conclusion that the child is not tuberculous. W. H. D.

LANTUEJOUL, PIERRE: TRAUMATIC INTRACRANIAL HEMORRHAGES IN THE NEW-BORN. (Gazette Des Hopitaux, March 18, 1922, p. 341.)

Treatment should be prophylactic above all. Women must be examined during pregnancy for the necessity of anti-luetic treatment, of changing a breech to a vertex presentation, or of planning a Caesarean operation. During labor one must avoid multiplying interventions which endanger the child's cranium; every forceps extraction and every extraction of the aftercoming head should be done with the greatest possible gentleness. It should be remembered that the child bears asphyxia better than traumatism. When the child is delivered apparently dead, it may be revived by insufflation, and when in doubt a lumbar puncture may be done supplemented if necessary by a puncture of the anterior fontanel. If these measures do not suffice to relieve the pressure on the cerebral centers, then trephining may be done. Injections of maternal blood will arrest hemorrhage while awaiting the results of other measures. In the days following birth, lumbar puncture seems to be the best treatment. W. H. D.

AVIRAGNET, E. C., & DORLENCOURT, H.: DRY MILK IN THE FEEDING OF WELL AND SICK BABIES. (Le Nourrisson, March, 1922, p. 81.)

The results of experience since the publication of the author's first work on this subject in 1911 are reviewed and the following conclusions arrived at:—The findings confirm the view that a powdered milk of good quality constitutes an extremely favorable food for the artificial feeding of children. It may be used as a complete and sole food for the normal infant; in this regard it is neither superior or inferior to a milk of good quality, sterilized, condensed, or in any other form. Powdered milk may be utilized in the most varied forms of indigestion in infants, and here it is not only a food but a medicament, and is the food of choice in such cases. Apart from its medical value, dry milk has the advantage of being easily transportable over great distances. W. H. D.

ST. LAWRENCE, WILLIAM: POTENTIAL CARDIAC DISEASE AND THE PREVENTION OF ORGANIC HEART DISEASE IN CHILDREN. (Journal A. M. A., April 1, 1922, p. 947.)

St. Lawrence reports the continuous observation of 65 cases of potential cardiac disease for an average period of 4½ years, Forty-nine of these cases remained free from evidence of cardiac disease during that time. Of 25 cases with acute rheumatic fever in the series, none contracted a heart lesion; of 9 cases with myositis, bone and joint pains and sore throat, none contracted a heart lesion. Sixteen cases contracted a heart lesion while under observation, and in every one of these cases the clinical picture was dominated by chorea in a severe form. Of 41 cases with chorea in the series, 16 (39 per cent.) contracted a lesion in the heart. In untreated potential cases, rheumatic fever is the most important factor concerning heart lesions; in potential cases under management, chorea is the most important factor concerning disease of the heart. Preventive measures were of benefit when directed against acute rheumatic fever, bone and joint pains and sore throat, but these measures were of little value when directed against chorea. W. H. D.

THOMSON, CHARLES A.: REMOVAL OF DIPHTHERITIC EXUDATE FROM THE LARYNX. (Journal A.M.A., April 22, 1922, p. 1198.)

Thomson cites the many disadvantages of the tube method of treating laryngeal diphtheria including the possibility of the development of a "chronic tube" case. He has devised a straight applicator with a screw tip which will hold firmly a piece of gauze which he has used to clear the larynx of mucus and membrane by direct laryngoscopy. The results have been surprisingly good and have brought about a lower number of intubations and a much lower mortality for laryngeal diphtheria. The youngest patient so treated was 7 months old and the oldest, 12 years. W. H. D.

GRULEE, CLIFFORD G.: TREATMENT OF PYLOROSPASM IN INFANTS. (Journal A.M.A., April 22, 1922, p. 1183).

Pylorospasm is several times as frequently encountered as pyloric stenosis, and it deserves as much attention as the latter condition. The indications are to relax the spasm at the pyloric sphincter and to remove the irritation in the stomach resulting from the accumulation of disintegrated food, which in turn is due to the remaining of the food in the stomach for a longer period than normal from the pyloric closure. For the first indication, atropin is to be advised; for the second, the cleansing of the stomach by washing and the giving of adequate non-irritating food. Atropin is administered hypodermically in the dose of 1-1000 to 1-500 grains 15 minutes before each feeding. Before the food is given, the stomach is washed until the washings return clear;

the food is then given through the tube before it is withdrawn. The food is practically always a mixture of albumin milk and a dextri-maltose combination. When the pyloric spasm develops in a breast fed infant, the child is allowed to nurse after the stomach washing. The average case will require from 2 to 3 weeks of this treatment, and the approach of a cure is noted by the absence of vomiting when the washing of the stomach is omitted for 2 or 3 feedings each day. W. H. D.

ROYSTER, LAWRENCE T.: *Otitis Media.* (Southern Medical Journal, January, 1920, p. 10.)

The author after an experience of 20 years believes that all uniformly red drums should be incised. When cases of middle ear inflammation are accompanied by tenderness over the mastoid cells it is generally agreed that the drum should be incised in order to promote drainage of the mastoid cells, therefore early incision should be made to prevent extension into these cells. He does not believe in using medication in the external auditory canal. A long classification of the different types of otitis media is given.

A. BRET RATNER.

LUDLUM, WALTER D.: FEEDING SICK CHILDREN. (New York State Journal of Medicine, April, 1922, p. 165).

Ludlum believes that the feeding of children during acute febrile illnesses is neglected and that they are not fed nearly as well as the state of our knowledge justifies. He lays stress on the importance of written feeding instructions for the nurse or mother. The tendency to eliminate other foods in acute illnesses and leave the milk unchanged is a pernicious one and persists in spite of the fact that for many years it has been taught that milk should be eliminated from the diet of a child having an acute gastrointestinal disturbance. The starchy foods, fruit juices and clear broth, with plenty of water should be advocated during the first day or two of acute febrile disease. Milk may be added cautiously and the last item to be allowed in acute illness is meat. The feeding intervals should almost never be less than 3 hours. W. H. D.

LA FÉTRA, LINNAEUS EDFORD: ACUTE MIDDLE EAR INFECTIONS IN CHILDREN. (The Journal of the American Medical Association, May 1, 1920, p. 1222.)

La Fétra enumerates the many symptoms of middle ear infection but claims that the only real diagnostic sign is a bulging drum. Retraction of the drum and in addition some redness is frequently the first sign of inflammation in the rhinopharynx and often confirms a suspicion of acute rhinitis as cause for fever up to 102° or 103° when there is yet no running or stuffiness of the nose. The next sign is some redness along the malleus, and the next, some fullness and redness of Shrapnell's membrane. These signs are present so commonly with head colds in children, and subside so readily, that this small degree of otitis can be considered a very common accompaniment of acute rhinitis. The next signs that appear mean on otitis media, namely, redness and bulging of the drum membrane, first behind and later in front. The retraction meanwhile increases, and the appearance of the drum is that of a small red ring or doughnut. When accompanied by a high fever, these signs are sufficient justification for incision of the drum; but by far the larger number of such cases will subside in a day or so, if the nostrils are treated by a weak epinephrin solution, and hot irrigations of the ear are employed. The drum in this condition, if incised, will frequently reurn to normal more quickly than if not opened. The paracentesis he recommends to be done under anesthesia, preferably chloroform, though an exception may be made to this rule if the patient is an infant and only one drum is to be incised. The incision should be a J or U shape, and should be carried well upward. He advises irrigation with hot boric acid solutions immediately after incision. Mastoid involvement and sinus thrombosis are, according to the author, rather infrequent complications. His plea to the general practitioner and to the pediatrician with regard to ear infections in children is that careful routine examination of the ears be made in all cases in which fever is present. C. A. LANG.

ARCHIVES OF PEDIATRICS

JUNE, 1922

HAROLD RUCKMAN MIXSELL, A.B., M.D., Editor

COLLABORATORS:

Rowland G. Freeman, M.D...New York
W. P. Northrup, M.D........New York
Henry D. Chapin, M.D......New York
Francis Huber, M.D..........New York
Henry Koplik, M.D.........New York
Walter Lester Carr, M.D....New York
C. G. Kerley, M.D..........New York
L. E. La Fétra, M.D.........New York
Royal Storrs Haynes, M.D...New York
Herbert B. Wilcox, M.D.....New York
Charles Herrman, M.D......New York
Wm. Henry Donnelly, M.D...Brooklyn
Frank H. Richardson, M.D....Brooklyn
Edwin E. Graham, M.D.....Philadelphia
J. P. Crozer Griffith, M.D..Philadelphia
J. C. Gittings, M.D.........Philadelphia
A. Graeme Mitchell, M.D..Philadelphia
Charles A. Fife, M.D.......Philadelphia
H. C. Carpenter, M.D.......Philadelphia
I. A. Abt, M.D................Chicago
William P. Lucas, M.D...San Francisco
R. Langley Porter, M.D...San Francisco
E. C. Fleischner, M.D.....San Francisco
Oscar M. Schloss, M.D.........Boston
Maynard Ladd, M.D.............Boston
Charles Hunter Dunn, M.D.....Boston
Henry I. Bowditch, M.D.........Boston
Richard M. Smith, M.D.........Boston
L. R. De Buys, M.D.......New Orleans
Robert A. Strong, M.D....New Orleans
John Foote, M.D............Washington
Joseph S. Wall, M.D.......Washington
B. K. Rachford, M.D.........Cincinnati
Henry J. Gerstenberger, M.D..Cleveland
Borden S. Veeder, M.D........St. Louis
Frederick W. Schlutz, M.D.Minneapolis
Julius P. Sedgwick, M.D...Minneapolis
William Weston, Jr., M.D..Columbia, S.C
A. D. Blackader, M.D.........Montreal
Edmund Cautley, M.D..........London
G. A. Sutherland, M.D........London
J. D. Rolleston, M.D...........London
J. W. Ballantyne, M.D.......Edinburgh
James Carmichael, M.D.......Edinburgh
G. A. Wright, M.D.........Manchester

PUBLISHED MONTHLY BY E. B. TREAT & CO., 45 EAST 17TH STREET, NEW YORK.

SOCIETY REPORT

THE AMERICAN PEDIATRIC SOCIETY.

Thirty-fourth Annual Meeting Held at the Wardman Park Hotel, Washington, D. C., May 1, 2, *and* 3, 1922.*

The President, Dr. Maynard Ladd, *of Boston, in the Chair.*

APPLIED DIETETICS IN OUT-PATIENT DEPARTMENTS.

Dr. Maynard Ladd, in his presidential address, stated that the establishment and maintenance of food clinics was a very necessary and useful adjunct to the medical out-patient department. So far as he could learn there were very few institutions which had established and operated food clinics of the kind he had in mind. The Boston Dispensary Food Clinic was started in April 1918 by Michael M. Davis, then director, and Miss Frances Stern of the Federal Commission of the U. S. Department of Agriculture. The purpose of the Food Clinic might be called a demonstration of applied dietetics. It was intended to assist the physicians of medical clinics in carrying out food treatment. It was distinctly a part of the medical institute, in which the medical, dietetic, social and economic problems of each case were correlated. It was not a center for the distribution of food, in which respect it differed from the diet or food stations established in many places during the war. It necessarily included the "nutrition classes," but had a much larger scope. The fundamental principle of organization was that every patient accepted must be under direct medical supervision, by one, who, by virtue of his specialty or experience, might be judged competent to determine the nutritional requirements of the case. It was the duty of the Food Clinic not only to follow the lines of treatment indicated by the physician, but to investigate through medical social service the home conditions, economic resources of the family, and, when necessary, to bring the case into relation with proper agencies of help. The organization of the Food Clinic and its relation to other departments should be very distinctly prescribed. There were many possibilities of friction and misunderstandings, which they had experienced. Medical supervision should be directly exercised within the Food Clinic, in order that all departments might work in harmony. It was not reasonable to expect that the dietitian or technical food worker was sufficiently familiar with the medical side of her cases to act at all times wisely without the advice of a physician, and she was more likely to seek that advice if she was responsible to a physician of the Food Clinic alone, than if she attempted to keep personally in touch with all physicians who referred patients to her.

---

*Detailed report specially made for Archives of Pediatrics.

The relation of the Social Service to the Food Clinic was also a matter of great importance. There must be a Social Clinic executive in the Food Clinic and under the direction of the Chief Dietitian. The first investigation of the social and economic conditions of the patient would be made by this worker, and her findings reported to the chief dietitian. By consultation they might then be able to determine in each case whether the continued social work should be conducted by the Food Clinic, or transferred as a special problem to the General Social Service Department. In general, the organization of the Food Clinic was the same as that of any medical clinic and should be on the same plane. Its special internal organization, Dr. Ladd said, might best be described under 3 heads, namely, (1) administrative; (2) dietetic; and (3) educational. The head of the Food Clinic should be the medical consultant. His duties were primarily medical, referring to the internist or pediatrist cases, which, in his judgment, required extensive medical investigation, or taking the responsibility of passing the case directly to the dietitian on the basis of his own examination. He kept in touch with the general progress of the cases and saw that the patients reported back periodically to the special clinics from which they had been referred. He was responsible for the exclusion of contagion from the demonstration classes, and gave medical instruction in applied dietetics to classes, to graduates and to undergraduates. The other members of the staff were the Chief Dietitian and her assistants, the trained nutrition worker, the social worker and the clinic executives. A competent dietitian would be allowed to exercise her own initiative in many cases, such as obesity, constipation, and undernourishment, but there were other groups, such as renal, cardiac, diabetic, and tuberculous, which required close and frequent medical supervision—cases which the dietitian was not capable of handling alone. The patients from the pediatric or medical department referred to the Food Clinic were required to report back to the referring clinics periodically and might attend the Food Clinic only so long as they were medically supervised. The liaison between the referring department and the dietitian should be the medical supervisor of the Food Clinic rather than the dietitian herself.

The functions of the dietitian were to determine the family budget, and its possibilities of supplying the necessary food which the diet called for. She might be able to advise a cooperative mother how to readjust her expenditures, so that the proper food might be provided, and she could instruct her in the art of utilizing cheaper products to attain the same end served by the more expensive foods. When the family budget was hopelessly inadequate, it was the duty of the dietitian to secure, through existing associations, such help as might be needed in the way of food or money and to see that the aid was properly applied. Selection and preparation of the food was no less important than the question of finance. The responsibility for dietetic treatment could not be assumed unless instruction was provided as to the simple facts relating to food, the methods of preparing them, etc. This had to be done in 2 ways: (a) by demonstration in the class to groups of mothers and children, and (b) by home visits, in special cases, by the food worker to help the mother apply the principles taught in the class. In this phase of the work the dietitian was more likely to gain the cooperation of recent arrivals in this country if she corrected what was bad in their habits and customs, instead of trying to force an entirely new dietetic regime upon them. Still another function of the food clinician was to conduct classes which had a special objective. They had, for instance, established classes in (1) obesity, (2) constipation, (3) malnutrition, and (4) diabetes. The best results in such group instruction could not be obtained without periodical medical supervision.

The nutrition class for undernourished children was one of the most important of the special groups of the Food Clinic. Such classes were being extensively organized throughout the country. The problem of handling the undernourished child was not, however, as simple as the layman might infer when he saw untrained persons qualify as chief nutrition workers after a 2 weeks' course of instruction. Malnutrition, if severe, was always primarily a medical problem, and required long-continued supervision. The Food Clinic, established in connection with a well organized outpatient department, was the logical place for the operation of nutrition classes which might serve not alone to meet the needs of the patients drawn from the clinics, but as a school for the proper training of nutrition workers.

Speaking of the educational feature of the Food Clinic, Dr. Ladd pointed out that a clinic organized along the lines he had indicated would offer a training to students in medicine, public health, child welfare, nursing, dietetics and social service. The Clinic executive should be a person qualified to instruct in the principles governing the organization and administration of the Clinic, and the part played by social service in furnishing information to the dietitian, and to the medical supervisor.

In closing, Dr. Ladd said, "The Food Clinic—whether one adopts the name or not is unimportant—should become an established department of every well organized clinic for the treatment of ambulatory patients." Its development would depend upon the extent to which public opinion supported the idea. As pediatricians, who were so largely concerned in the problem of nutrition, and food as a means of attaining it, we could by our support of the idea of a Food Clinic do much to put applied dietetics upon a scientific basis, and greatly influence public opinion as to its importance. At the same time, by the precept and example of well regulated clinics, much might be done to clarify the subject of food in relation to diseases, in our own minds, in the minds of students and hygienists, and ultimately in the thoughts and lives of the general public.

THE "SPLENO-PNEUMONIC" REACTIONS IN PULMONARY TUBERCULOSIS OF CHILDREN.

Dr. P. F. Armand-Delille, of Paris, sent this communication, in which he stated that recently he published in the "Académie de Médicine de Paris," a short article on a certain form of congestive reaction of the lungs, giving the clinical type of the so-called "Grancher's spleno-pneumonia" but invading the whole lung, and also that when there was only a small tuberculous lesion in it, this seemed to be peculiar to pulmonary tuberculosis in young people. Dr. Armand-Delille sent radiographs of a few of the most characteristic cases that he had recently observed in his children's ward at the Hospital Debrousse, Paris. These radiographs showed a deep opacity, extended throughout the whole of one lung, which went with the stethacoustic signs of an extensive condensation of this part of the chest, similar to a pleurisy, but without any fluid at puncture.

Often after a continued fever, called in France "Landouzy's typhobacillosis," the signs of a condensation of one of the lungs appeared by degrees. Many of those children had had before symptoms of tracheobronchial adenopathy, but not in all cases. Sometimes those signs began at the apex, sometimes at the base, and at the beginning it appeared to be a pleurisy, because all the symptoms appeared that Grancher described under the name of "spleno-pneumonia," but very often also, all the lung was invaded at the same time. The consolidation was nearly complete, vibrations disappeared, and sometimes the tubal breathing was so strong, that it took an amphoric character, and one thought it was a cavity in the lung or a bronchial dilation. Radioscopy showed a complete or nearly complete opacity of the whole lung, contrasting to the normal aspect of the other lung, but the diaphragm was not immobilized as in pleurisy, the mediastinum was not pushed aside and contrary to the aspect in pleurisy, the shadow was thicker in the median part of the lung than at the base, in the neighborhood of the pleural sinus, which sometimes kept a light transparency. One could sometimes observe in a limited area, more often in the apex, a clearer zone of disintegration, which gave the aspect of a cavity, modified by coughing; this aspect corresponded to the cases in which auscultation gave râles, and also corresponded to the focus of tuberculosis.

One could think that the beginning of these forms was a pleural or so-called cortico-pleural process, but the pleura was freed and, as shown by the radiographs, an artificial pneumothorax might be made.

In some cases, which seem to correspond to the pure "spleno-pneumonic" forms, the resorption could come progressively if helped by general physiotherapeutic treatment, especially with very well regulated heliotherapy, but it was always very slow and always incomplete, the x-ray examination showing some opaque tracts irradiating from the hilus and following the bronchial ramifications. In other cases, at a certain time, the lung was invaded by caseation, and it becomes a real caseous pneumonia with terminal large cavities. In a third order of cases, it became an organization of the condensation, a sclerosis of the lung appeared with pleural adhesions, retraction of the wall of the chest, attraction and deviation of the mediastinum, and sometimes later bronchial dilatations.

The occurrence of these special forms of spleno-pneumonic reactions was not as infrequent as one might think. Out of 120 children in the writer's ward for tuberculosis, it had been observed during the past 3 months in more than 10 cases. Cases of this kind have often been considered to be pleurisy, if one did not make an exploratory puncture, and only x-ray examination and the practice of artificial pneumothorax could explain their real nature.

D'ESPINES AND ALLIED SIGNS IN CHILDHOOD.

Dr. John Lovett Morse, of Boston, some 6 years ago finding that there was considerable difference of opinion as to what constituted D'Espine's sign looked up the original descriptions, and had recently communicated with D'Espine. As a result of this investigation, it was evident that the sign to which D'Espine originally called attention was, therefore, a whispered sound following the spoken voice and heard over the spinous processes. Normally, no such sound was heard. D'Espine believed this to be the earliest sign of enlargement of the tracheobronchial lymph nodes. He also believed that the bronchial character of the spoken voice did not normally extend below the seventh cervical spine and that extension of the bronchial sound below this point was evidence of an enlargement of the tracheobronchial lymph nodes. He considered that the extension of the bronchial voice below the seventh cervical spine was always a later sign than the addition of the whispering sound to the spoken voice, and that it meant a more advanced process. He paid little attention to the character of the whispered voice (meaning by this a whisper, not the whispering sound heard after the spoken voice) and believed that extension of the bronchial respiratory sound of dullness on percussion below the seventh cervical spine was a still later manifestation, and that it signified much more marked changes. Incidentally he warned against mistaking an unusually loud or deep voice for bronchophony and stated that sometimes it was impossible to determine anything from the voice itself, because of its peculiar character and the thinness of the chest wall.

In view of the great differences of opinion as to the terminology, it seemed worth while to examine a series of children to determine, if possible, whether the addition of a whispering sound to the spoken voice was a normal or usual condition or not, whether this whispering sound was always added to the spoken voice before any other changes occurred in the voice or respiration and where the change from the bronchial to the vesicular character of the spoken voice and respiration normally occurred. It also seemed worth while to determine whether the change from bronchial to vesicular occurred first in the spoken or the whispered voice, whether the change occurred earlier or later in the character of the respiration than in that of the voice and the relation of dullness over the spinous processes and between the scapulae to these changes. One hundred and eighteen private office patients between the ages of 2 and 14 years, were studied. In 88 cases, or nearly 75 per cent., there was no whispered sound after the spoken voice; in 24, it was heard through the seventh cervical spine, and in 6, below it as well. It seemed evident therefore, that a whispered sound after the spoken voice was not the usual condition and was probably abnormal. The change from bronchial to vesicular in the spoken voice took place between the seventh cervical and first dorsal spines in 90, and above it, in 9. There was no bronchial voice anywhere in 9; in only 6 did the bronchial voice extend below the seventh cervical spine. The change from a bronchial to a vesicular whisper took place between the seventh cervical and first dorsal spines in 87 instances. The change from bronchial to vesicular respiration occurred between the seventh cervical and first dorsal spines in 97 instances. In only 15, or less than 13 per cent., did the bronchial respiration extend below the seventh cervical spine. The spinal dullness stopped at the seventh cervical spine in 95 cases and above it, in one. In 54 cases, there was no whispering sound after the spoken voice, the changes from bronchial to vesicular in the spoken and whispered voices and in the respiration occurred at the junction of the seventh cervical and first dorsal spines; there was no dullness below the seventh cervical spine and no interscapular dullness. After a detailed analysis of these cases, it seemed fair to conclude that when there was no whispering voice sound after the spoken voice, the bronchial voice, whisper and respiration and the spinal dullness did not extend below the seventh cervical spine, and there was no intrascapular dullness, conditions were normal. It seemed probable that they were not normal when the bronchial voice, bronchial whisper, bronchial respiration and spinal dullness extended below the seventh cervical spine. They were certainly abnormal when there was intrascapular dullness. The whispering sound after the spoken voice, D'Espine's sign, is often the earliest and only abnormality. It may, however, be absent when one or more of the other signs are present. The whispered voice is a somewhat more delicate test of pathological changes in the tracheobronchial region than is the spoken voice. The respiratory sound has an intermediate value. The value of percussion over the spinous processes is about the same as that of the respiratory sound. Intrascapular dullness is a late sign and is found only when the pathological changes are considerable.

Discussion. DR. WALTER R. RAMSEY, of St. Paul, stated that he had had the pleasure last summer to be in Geneva and to be Dr. D'Espine's guest. He thought Dr. Morse had interpreted Dr. D'Espine's ideas correctly as far as he could determine. Dr. D'Espine always used an American stethescope with a small bell. He said it had been interesting to see over a long period of years the various interpretations which had been placed on this sign. Originally this point was only one of many factors that went to make up the diagnosis, but it was an important one when one found it.

DR. B. RAYMOND HOOBLER, of Detroit, said that as he recalled it Dr. D'Espine stated that this sign was found in only about 50 per cent. of tuberculous subjects. He wondered whether this was correct or whether Dr. D'Espine had changed his mind on that point.

DR. CHARLES HENDEE SMITH, of New York, stated that he took particular pains to study this sign in every child he examined. He agreed with Dr. Morse that this sign had been misinterpreted. D'Espine said the sign was heard over the vertebral column between the seventh cervical and the first dorsal; perhaps he meant at the seventh cervical. It seemed to him that for the whispered sound it could be nothing else. The whispered sound was more accurate than the speaking voice. Personally, he thought the word bronchial was a very poor description of the voice sound; it was tracheal or tubular or something else than bronchial. It was not a flat "ah" sound but more tubular. In New York they were calling it tubular and not bronchial. Perhaps it would be well to abandon the use of the expressions positive and negative D'Espine's sign and say the whispered voice extends to the first cervical or to the first, second or third dorsal vertebra, as the case may be.

DR. J. CLAXTON GITTINGS, of Philadelphia, described some work that he and Dr. Fetterhoff did on frozen bodies some years ago. They removed the spinal columns of 2 bodies, one a child 2 years and one of 7 years. While it was impossible to describe the cavity that was left after one had taken out the muscle and connective tissue, its conformation was such that percussion sounds over the spinal column would have to be interpreted with a great deal of caution. The character of the bony cavity was such that it was impossible to conceive that a few changes in the bronchial nodes could make a difference in the transmitted sound, so that unless there were a great many enlarged nodes along the trachea, not along the bifurcation of the trachea, they could not be interpreted through the spinal column. One might get a dull sound below the first dorsal without apparently any mediastinal disease.

Dr. John Lovett Morse stated that as regarded Dr. Hoobler's question as to the frequency with which D'Espine's sign was found in tuberculosis, all that these signs meant was simply that there was a difference in density without any reference to the cause of it. His feeling was that a great many more thickenings were non-tuberculous than were tuberculous. He had seen this sign come up during bronchitis and disappear again. In eliciting the sign, one had to be very careful that the patients did not make a whispering sound after the spoken word. One should have the patient try different words and take one that he could say without following it with a whispered sound. He could not agree with Dr. Smith that the sound change occurred at the seventh cervical vertebra; he thought it occurred between the seventh cervical and the first dorsal vertebrae. He agreed with Dr. Smith as to the advisability of dropping the custom of saying D'Espine's sign positive and D'Espine's sign negative and of saying that one heard the whispered sounds after bronchophony or a change in the whispered voice at a certain level.

FOLLOW-UP RECORDS OF A SERIES OF PATIENTS WITH BRONCHOPNEUMONIA.

Dr. Walter Lester Carr, of New York, stated that in 1919 there were 237 patients with bronchopneumonia admitted to the Pediatric Service of the City Hospital. Of this number, 179 had bronchopneumonia and 12 per cent. of them died. Dr. Guilfoy of the Department of Health states that in 1920 there were 2,384 deaths in New York from bronchopneumonia in children under 2 years of age, while in 1921, there were only 1,557. He could give in percentage what proportion of the children who were ill with bronchopneumonia died, but the statistics of the Henry Street Settlement for 1920 gave 1,377 cases of bronchopneumonia in children below 2 years cared for by visiting nurses, and of these 193 died, a percentage of 14. If we assume this mortality as correct, the mortality table of the Department of Health would show a disease incidence of nearly 17,000 cases for twelve months. In a recent communication (H. D. Chapin's in the Jour. A. M. A., July 23, 1921), attention was directed to the importance of home care for children with bronchopneumonia and urging such treatment wherever possible. For comparison the article gave the mortality in acute bronchopneumonia as 117 of 282 cases in one institution, and 20 of 48 cases in another. These figures for home care and nursing seemed so unusually good for a disease so treacherous as bronchopneumonia that they led the writer to attempt to solve some discrepancies of the mortality of hospital patients under his own observation, both in the hospital and after leaving the institution. It was interesting in studying the mortality of a disease treated within a hospital or at home to compare the incidence of the disease not only by age but by epidemic influence. For example, in the recent 1922 mild epidemic of influenza, there had been many children with bronchopneumonia who had done well in the hospital and patients in their homes had recovered without a high mortality. In private practice, children with measles had not, as the writer had observed them during the past few months, had bronchopneumonias as a fatal complication. Without a knowledge of bronchopneumonia and its average mortality, we could accept wholly this percentage of calculation of home care and mortality, especially as the statistics of the Henry Street Settlement by nurses in charge show that about 10 per cent. of severe cases of bronchopneumonia were sent to hospitals and their calculations are misleading to this extent. Compared with a mortality of 13.33 per cent. in 1031 children, cared for by the Henry Street Settlement in 1919, the mortality rate for children under 2 years of age, cared for at the City Hospital during an influenza epidemic, was not excessive, nor is it especially favorable to visiting nurses as during the year 12 per cent. of children under 2 years with bronchopneumonia were referred to hospitals by nurses. The complete figures of a follow-up series from the City Hospital so showed the advantage of checking up patients after they had left the hospital. Without intending to disparage the value of home nursing, comparison had been made with the Henry Street Settlement statistics to show that no one agency could completely determine the mortality of a disease like bronchopneumonia, which, in its association with epidemics and its close association with tuberculous changes, might give a low mortality rate in one calculation and a high one in another. To determine the results of the hospital treatment in bronchopneumonia, follow-up visits by social service workers and nurses from settlements should be made and patients should report back to hospitals for reexamination.

Discussion. DR. J. P. CROZER GRIFFITH, of Philadelphia, stated that there were 3 elements that affected the prognosis in bronchopneumonia in children: (1) the age had to be taken into account; (2) we must take into consideration the fact that epidemics varied from year to year, and (3) we must take into account the other diseases which prevailed at the time. Another factor that made the estimation of mortality rates very difficult was the diagnosis. There were typical cases which everyone recognized, but there were also a great number of borderline cases the diagnosis of which depended entirely upon the observer. If one had any doubt on this point, let him look up the literature and see how widely well known physicians varied as to the diagnosis of croupous pneumonia and bronchopneumonia, yet croupous pneumonia had a very different mortality rate from that of bronchopneumonia. Dr. Griffith said he had given up trying to find anything that could be stated as an average mortality in bronchopneumonia in children.

DR. CHARLES HERRMAN, of New York, stated that the great advantage of home, as against hospital, treatment was shown in the primary disease, measles, whooping-cough, influenza, to which the bronchopneumonia was secondary. After the bronchopneumonia as a complication was present, the difference between home and hospital treatment was practically nil.

DR. CHARLES HENDEE SMITH, of New York, spoke of the difficulty they had in teaching their internes to differentiate between the types of pneumonia; they found difficulty in teaching them that a child might have lobar pneumonia, croupous pneumonia or bronchial pneumonia. The average physician called everything bronchopneumonia in a child. He had been interested in one method that would differentiate between lobar and bronchial pneumonia in a child, and that was the x-rays; lobar pneumonia casts a shadow, while bronchial pneumonia did not. That test was very useful in making a distinction.

Dr. Walter Lester Carr, in closing the discussion, said Dr. Koplik has spoken of the age mortality of bronchopneumonia which is true. This is shown in the reports of both the New York Department of Health and the Henry Street Settlement, although the Henry Street Settlement labors under the disadvantage of taking the diagnosis from many different physicians. As Dr. Griffith has said, age, the severity of an epidemic and the influence of other diseases must be considered. To help determine the type of pneumonia, Dr. Carr said he felt as Dr. Smith has indicated, that whenever possible an x-ray examination should be added to the record. In calculating the mortality, we must consider not only the age, severity of the epidemic and the fact that a child has or has not had other diseases, but we must take into account secondary infections. There are a number of children who go out from a hospital after having had an infection and later have a bronchopneumonia, which does not enter in the hospital statistics. It is very difficult to check up the factors that lead to a high mortality at one time and low mortality at another. During an epidemic of influenza, the hospital was so crowded that we had to send out the mild cases early and some of these may have had bronchopneumonia later. A fair statement of the mortality of the bronchopneumonias must take such factors into account.

STUDIES ON THE DIGESTION IN INFANCY.

HYDROGEN ION CONCENTRATION OF THE GASTRIC CONTENTS.

Dr. W. McKim Marriott, Dr. L. T. Davidson, and Dr. L. P. Harshman, of St. Louis, presented this study which was the first of a series on the mechanism of digestion in infancy. The object was to examine the processes of digestion from the standpoint of the newer physiology and chemistry and to observe the alterations in the processes as determined by the character of the diet.

Considering first the processes in the stomach, it had been shown that hydrochloric acid, aside from its influence on the digestion of proteins, was capable of performing other functions in the gastrointestinal tract. In common with other acids it exerted a marked bactericidal effect when present in sufficient concentration. It had some action in regulating the opening and closing of the pylorus. In the duodenum it lead to the production of secretin with consequent excitation of the flow of bile and pancreatic juice. The effective acidity of hydrogen ion concentration was to a large extent dependent upon the character of the diet. Certain foods had the property of binding, or partially neutralizing, a considerable amount of acid, due to their content of "buffer" substances. Milk is a good example of a food containing a large amount of buffer material. Cow's milk contains a much greater amount of buffer substance than does breast milk. Observations on the behavior of breast milk as compared with cow's milk on the addition of varying amounts of hydrochloric acid showed that to bring cow's milk to the same degree of acidity as breast milk required approximately three times as much hydrochloric acid as in the case of breast milk. The character of the milk fed, therefore, influences the degree of hydrogen ion concentration in the stomach. In considering the acidity of the gastric contents in infancy, the standard taken for comparison was the gastric contents of the normal infant fed exclusively on breast milk. In general, greater degrees of acidity were observed in older infants, although there were individual exceptions. It has been shown that peptic digestion is slight at a degree of acidity less than pH 4.0, but that from this point on considerable digestion occurs. In two-thirds of the infants examined, the acidity was quite sufficient to allow for considerable digestion of protein. The bacteria present in milk, particularly those of the colon-typhoid group, were inhibited markedly by an acidity corresponding to pH 5.0; at a pH as acid as 4.0 practical complete inhibition or death of these organisms occurs. If one assumed that breast milk was the most suitable food for the normal infant, it would seem likely that the mean acidity of gastric contents following the feeding of breast milk to such an infant would be optimum for the purposes mentioned. In a consideration of the acidity of the gastric contents of infants who were not normal, but were fed exclusively on breast milk, there was a marked variation from normal figures. The infants in this group were in a condition of athrepsia or suffering from acute infections. In every instance the acidity was less than that corresponding to a pH of 4.0. The mean value was 5.1. As the value of pH is a logarithmic one, these figures indicate that the degree of acidity in the stomachs of this latter group of infants averaged less than 1/20 of that of normal infants. The degree of acidity was insufficient for peptic digestion, not great enough for complete bacterial inhibition, and presumably below the optimum for effect on the pyloric sphincter and on the duodenal secretions.

A study of the behavior of cow's milk in the stomach of the normal infant shows that the excess of buffer substances binds the hydrogen ions and it appears that the infant's stomach does not respond by producing a sufficient amount of acid to overcome the excess of buffer substance. If the acid binding property of milk were a factor explaining the unsuitability of cow's milk for infants, one would expect that if the buffer substances were removed from the milk or neutralized that cow's milk could be given to babies in the same amounts as breast milk, or in other words, that undiluted cow's milk could be fed to young babies. There are various ways in which the removal or neutralization of the buffer substances may be accomplished. A simple one is the artificial souring of the milk. Here the buffer substance is greatly altered by the lactic acid. The extent to which this alteration occurs depends upon the degree of souring attained. The question as to whether it was possible to feed undiluted cow's milk to babies provided it had been soured was investigated. The experience of a number of years led them to conclude that such milk might be given to even young babies without the appearance of symptoms which result when the cow's milk, with unchanged buffer, was administered, and they believed the buffer's effect to be an important one in explaining this fact. Metabolic experiments on infants had shown better absorption and retention of both organic and inorganic constituents during the lactic acid milk feeding.

Then a question might arise whether or not an excessive degree of gastric acidity might be disadvantageous. The writers believed this to be the case, judging from the reports in the literature, although none of the subjects studied by them so far had shown such an effect. When an excess of acid was added to lactic acid milk, it did not increase the acidity to as great an extent as when added to breast milk. Therefore, the feeding of lactic acid milk to an excess of gastric acid would actually result in a lesser degree of acidity than if the same infant was fed on breast milk. Other forms of feeding which had for their basis lactic acid milk, such as protein milk, lead to results of the same character. In the case of infants with lowered gastric acidity, as, for example, athreptic infants, a more nearly normal hydrogen ion concentration of the gastric contents was obtained when lactic milk was fed than when breast milk was fed. It was in just this type of infants that the lactic acid formulae had been of the greatest value.

The writers felt that the gastric acidity of infants and the buffer value of infant's food were factors which were of distinct importance in infant feeding and that these factors had not been sufficiently emphasized in the past.

Discussion. Dr. John Howland, of Baltimore, expressed doubts as to whether a low hydrogen ion concentration was a common finding in celiac disease. He said he had patients with that condition and Dr. Blackfan had estimated the hydrogen ion concentration of the stomach contents and found it higher rather than lower than normal. If Dr. Marriott was corroborated, this would be a very interesting finding. It was too early to say whether a lessened secretion was the cause or the result of the disease. If it were shown to be the cause, it would affect our methods of treatment.

ACID MILK IN INFANT FEEDING.

Dr. Henry L. K. Shaw, of Albany, N. Y., stated that acid milk for infant feeding should only be prepared from clean fresh milk. Its use did not oppose dairy hygiene or let down the bars of cleanliness, for dirty and unsanitary milk would remain dirty, unsanitary and harmful whether alkaline or acid, raw or boiled. Buttermilk was difficult to procure with any degree of regularity and its composition and degree of acidity varied with each churning. Acid milk was obtained from fresh, sweet whole milk which had been kept in a warm place until it thickened spontaneously or to which cultures of living lactic acid bacilli had been added and then allowed to sour and thicken. Lactic acid was produced very rapidly by these bacteria and, in from 24 to 48 hours, a quart of clean, fresh milk kept at room temperature would have reached such a high acidity that it spontaneously curdled. There was no evidence to show that this lactic acid caused chemical or bacterial injuries to the infant. On the other hand, it appeared to exert a decidedly favorable influence in metabolism in the absorption and retention of the nitrogen salts. The casein was changed by the action of the acid from calcium caseinate to lactate of casein, which was not acted upon by rennin and the formation of large tough curds was prevented. Hence the casein was in a state of fine coagulation similar in some respects to that of mother's milk. This rendered the albumin in acid milk more digestible and it could be given to young infants in larger proportions than in sweet cow's milk. The calcium being set free provides salts which were soluble and more readily absorbed. Hydrochloric acid and lactic acid appear to play supporting roles during gastric digestion.

In the preparation of buttermilk, as recommended by different authors, the food was boiled before it was used. This is also the case in the preparation of acid milk and albumin milk. A bacteriological study of these foods at the New York State Department of Health Laboratory showed no growth of lactic acid organisms in the boiled foods so that the favorable results must be due to the high acid content and not to the action of living lactic acid bacilli. The amount of acidity was determined by titration with a decinormal sodium hydrate solution with phenolphthalein as the indicator. A large number of acidity determinations of acid milk were made in the laboratory of St. Margaret's House by Dr. Frank J. Williams, who assisted the writer in this study, and the average acidity before boiling was 100 and after boiling it was reduced to 80. The high acidity exerted a remarkable germicidal effect. Tests of the urine acidity made during the course of this study showed that there was no increase in the acidity but that the acidity was diminished in the majority of cases examined. The writer, in 1910, in the Infants' Home adopted the de Mattos method of preparing artificial buttermilk in which whole milk was soured by the addition of a lactic acid culture and after coagulation sugar was added and the milk boiled for 3 minutes. It was safe to state that over 3,000 babies had been raised on this food with more or less success. Other methods had been tried during this period, but the Sisters had always requested a return to the sour milk mixtures, as the babies gained faster, looked healthier and were happier. Made in large quantities, it was easy to prepare and had several advantages for use in infants' institutions. The use of sweet milk had been discontinued and acid milk used in the preparation of all malt soup mixtures. Made with the acid milk the acidity averaged about 48. Dr. Shaw said they were now using plain malt extract, which did not contain the alkali, with very satisfactory results and this had an average acidity of 65. In the preparation of acid milk, more recently a technic had been used recommended by Miss Thesinghe, a trained nurse from Holland, who claimed that it was the method in general use in that country. Fresh whole milk was poured into a bowl, covered with cheese cloth and allowed to sour for 2 days in a warm room until thick like junket. It was then churned in a small glass butter churn for several minutes until it resembled fluid milk. A heaping tablespoon of sugar and one of flour for each quart were mixed into a paste with a little of the milk and this was added to the churned milk and then boiled from 3 to 5 minutes while stirring. By adding a little soured milk to the fresh milk, as a "starter," it would sour sufficiently in 24 hours. This could be fed without dilution to very small infants, although it was best to add ½ to 1 ounce of water in each feeding for the first few days. Up to May 1, 46 babies received this food at St. Margaret's besides 14 in private practice. In order to preserve the antiscorbutic vitamine, one-half the formula was boiled while the other half of the acid milk was added uncooked. The babies, fed on acid milk mixtures, for a long period of time in institutions, looked healthier and thrived better on the average than those fed on the regulation sweet milk formulas.

Discussion. Dr. Henry J. Gerstenberger, of Cleveland, asked Dr. Shaw if he used any special technic in making the sour Keller's malt soup. In the early days of Keller's malt soup, they had used Walker-Gordon milk in preparing the formula and found that when the mixture was boiled according to the directions the milk curdled so they had stopped heating it. Would Dr. Shaw please tell them whether the milk was boiled for 3 minutes or for a shorter period.

Dr. Thomas S. Southworth, of New York, said there were a few words in Dr. Shaw's paper that required elucidation. He spoke of malt soup prepared in the orthodox manner causing irritation of the buttocks and loose stools. Did he refer to the directions on the package of Keller's malt soup? Dr. Southworth said he had not always followed these directions, but had adapted them to the needs of the individual infant, and in that way had avoided the objections to the malt soup preparations to which Dr. Shaw alluded.

Dr. De Witt H. Sherman, of Buffalo, N. Y., said he had been interested in acid milk, particularly in finding some simple method whereby a more stable preparation could be made in the home and thereby avoiding the tremendous differences in the milks made by different people. In a paper prepared a few years ago, he had described the way in which they used the Bulgarian bacilli to prepare lactic acid milk. They first cultured boiled sterile milk and allowed it to stand at a temperature of 85° over night. In the morning it was found to be of approximately the correct acidity. It was then boiled again to destroy the activity of the Bulgarian bacilli, and put away on ice. An even simpler method was to culture the boiled milk and allow it to stand in a warm place for 24 hours, when its acidity would reach 180 to 190, an acid reaction of sufficient degree to destroy the Bulgarian bacilli. By this method they had found it easy to get acid milk which was fairly satisfactory. At the time he presented this paper, Dr. Sherman said he was surprised to find that some other acids would not take the place of hydrochloric acid, and following this up he had come to learn that gastroenterologists thought no other acid would take the place of hydrochloric. It was strange how from time to time they went back to what they had used in the past. They had formerly used whey and cream in certain gastrointestinal disturbances and found it efficient, and now they were coming back to lactic acid and going on to use whole acid milk even in young infants, and they were now learning the explanation of the beneficial effects of this kind of food, namely, that it afforded a type of protein that yielded amino-acids in the proper form for growth and one that produced cystin. The question of obtaining a suitable acid milk devolved on 2 points, whether we could get a dependable acid milk that was uniform every day and whether we could produce such a milk without contamination. He could not say whether the Bulgarian bacillus acid milk was entirely satisfactory, but it certainly was much safer than to use milk which had soured of itself. Dr. Sherman said he felt that lactic acid milk was safe and could be fed for a long time on account of the lactic acid it contained.

Dr. Clifford G. Grulee, of Chicago, related his experience in France in the preparation of lactic acid milk. They were unable to obtain the Bulgarian bacillus cultures and made the albumin milk in their own dairy. They had been very successful with it, and found that it was no more troublesome to make than the albumin milk made with the cultures.

Dr. Henry Koplik, of New York, said he agreed with Dr. Sherman, who put the question as it should be put. Finkelstein laid stress on the method of preparation, and his success in feeding protein milk was due to the fact that he got a definite uniform preparation every day. He agreed that it was dangerous to feed acid milk prepared in the ordinary way, that was to simply allow the milk to sour. There was danger that such a milk would cause diarrhea. As to the length of time that one should feed acid milk, if fed too long on this milk some children got a certain form of edema and older infants would not take it. They took the advice of Dr. Heiman and sweetened the protein milk. One had to remember that there was no panacea in acid milk or in protein milk.

Dr. Shaw in closing the discussion said the way in which they prepared sour malt soup was to boil the sour milk and then add the malt flour and sugar. They had a number of ways of preparing different proportions of ingredients, but the milk was always boiled. Both in private practice and in St. Margaret's House, they had no trouble with the acid milk, and the babies took it well.

THREE CASES OF ACUTE ENCEPHALITIS TREATED WITH SPECIFIC SERUM.

Dr. Henry F. Helmholz, and Dr. Edward C. Rosenow, of Rochester, Minn., presented this communication, in which the detailed history of 3 cases of undoubted acute encephalitis, treated with Rosenow's anti-encephalitic serum, was related. The effect of the injection of serum was very striking in all 3 cases, in fact, so striking that it seemed advisable to report even so small a group as this. They hoped in this way to interest others in the specific treatment of encephalitis, to determine if in a larger series of cases the same excellent results were obtainable. The experience of any one man with acute encephalitis was rather limited, but the number of cases was large in the aggregate, so they were anxious that the serum be tried out in a large number of cases. It was available to all who were interested in using it. They did not claim at present that the specific serum was the curative factor in these cases; all they could say was that with the injection of the serum there was a decided improvement in the patient's general condition and a complete clearing up of the nervous symptoms of encephalitis. Furthermore, from animal experiments which were described, it had been shown that the serum could protect animals from intracerebral injections of the streptococcus, which was not the case with normal horse serum.

Discussion. Dr. Rood Taylor, of Minneapolis, stated that his experience with the use of the specific serum in the treatment of encephalitis was limited to one case. The child was very ill and was given 35 c.c. of the serum; it died within 24 hours. The serum was essentially similar to that for poliomyelitis. He had been so thoroughly convinced of the beneficial effects of the poliomyelitis serum that he felt very favorably inclined toward the anti-encephalitic serum.

Dr. Henry Heiman, of New York, felt that inasmuch as no treatment of encephalitic lethargica had been effective, any new treatment that held out promise deserved a trial. He believed the serum really ought to be tried in a large series of cases to see if it had any influence on the mortality of epidemic encephalitis.

Dr. Helmholz said that his only reason for bringing this subject before the Society was to interest in this serum any who had these cases, not only encephalitis lethargica, but any kind of encephalitis. He thought they were dealing with a group of infections that had a tendency to localize in the central nervous system, and if we could give a serum that would be of help in curing these cases it would be a great step in advance. It was not a question of the higher mortality only but of the residual complications. The experience of any one man with the disease was necessarily limited, as the disease was comparatively rare, and it was only by having the serum used by a large group of men that they could hope to learn whether it had any specific action.

BLOOD IN BREAST MILK.

Dr. Isaac A. Abt, of Chicago, presented a report which concerned a male child, who, aside from being underweight, was otherwise normal. When the baby was 3 days old he became restless; his stools were noted to be black and tarry and at the same time the mother's milk from both breasts was a peculiar chocolate color. When the solution was allowed to stand, a heavy precipitate occurred, and on chemical and microscopical examination this proved, as had been expected, to be blood. The bacteriological examination of this fluid revealed staphylococcus albus. Chocolate colored milk continued for several days. The mother was otherwise apparently in perfect health. She had had no rise of temperature, and was having a perfectly normal puerperium with this one exception. The baby was withdrawn from the mother's breast and a wet nurse obtained. The blood continued in the expressed breast milk for 8 or 10 days, after which the breast milk dried up. It had been impossible to determine the cause of the bloody milk in the case of this mother. In searching the literature it was found that this condition might occur as the result of a variety of conditions, among which might be mentioned inflammatory processes, wounds and ulcers, though hemorrhages might occur from both breasts spontaneously without external cause. Neoplasm might produce hemorrhage, and it had been variously considered by some that they were benign and by others that they were malignant. It occurred in young women suffering from chlorosis or amenorrhea, also in the climateric. In another group, bloody milk might occur without any satisfactory explanation of etiology. Intracanalicular papilloma, myoma, and myxoma of the breast had been described as etiological factors. Chronic cystic mastitis in some instances produced bloody discharge from the breast. Red milk might be produced by the action of certain bacteria. Bloody milk occurs in cattle more frequently than was supposed. Small amounts of blood were very common. It might also be produced by trauma or marked hyperemia of the udder after parturition and might also be due to a catarrhal mammitis, or an acute and chronic streptococcus mammitis.

THE RATE OF SECRETION OF BREAST MILK.

Dr. Charles Hendee Smith and Dr. Katherine K. Merritt, of New York, presented a study of the rate at which the baby gets milk from the breast, as determined by weighing at short intervals during nursing, and also to determine the average time which it takes to obtain the entire feeding.

It might be fairly said that it was not desirable to let a baby nurse after he really stopped getting milk from the breast. The child who sucked would swallow, and if there was no milk he would swallow air. This increased his gastric distention and predisposed to vomiting and colic, as had been pointed out several years ago in a paper by Smith and LeWald on the relation of posture to digestion. Prolonged nursing was bad for the baby also because it meant fostering the habit of chewing the nipple when no milk was being secreted. In the second place, the saving of the mother's time was important. In addition, the sparing of the mother's nervous system had to be considered. A great many women complained that the prolongation of the nursing to 15 or 20 minutes made them exceedingly nervous, while they did not mind short nursings.

In making the observations, the infants were studied in groups and the results tabulated. From the results it seemed fair to conclude that a normal baby fed on one breast needed to nurse as a rule only 8 to 10 minutes. The normal baby took from 40 to 60 per cent. of his total feeding in the first 2 minutes, and from 60 to 85 per cent. in the first 4 minutes. After 8 to 10 minutes, very few babies got any milk whatever. This held true whether the supply was abundant, moderate or scanty. A few larger infants might get small amounts of milk up to 16 minutes.

The babies who needed both breasts usually got less from the second than from the first side, except when one breast regularly yielded a better supply. The rate at which a baby got milk from the second breast was similar to that of the first breast. The time after which the baby got no more milk from the second breast was usually shorter than from the first. The poor feedings had been completed in a relatively shorter time than the good ones. When the breast supply was evidently failing, the baby obtained all he could get in 3 to 5 minutes, as a rule. It did no good to leave a baby a longer time (15-20 minutes) at a failing breast in the hope of helping out a meager supply.

The method of fractional weighing may well be applied to every breast-fed baby, since it is the only way by which we can determine how long a given baby should nurse.

If a baby empties the breast in 5 to 8 minutes and showed no signs of discomfort from an adequate feeding obtained in that time, there seemed to be no good reason why he should not take his bottle in the same time. If the nipple holes were of good size, so that the milk flowed freely, nearly all infants would finish the bottle in less than 10 minutes. They evinced less distress than the nurse did over the rapid feeding. On the other hand, a slow nipple either discouraged the baby so that he would give up in disgust before he had finished the bottle, or else made him swallow so much air that he either vomited or had colic. Dr. Smith asserted that 8 to 10 minutes should be ample time for any but the feeblest infants to take a bottle.

Discussion. Dr. L. R. De Buys, of New Orleans, asked Dr. Smith whether if he had reversed his observations and had those babies nursed the breast that had been nursed second at first and the first breast second he would have obtained the same results. He thought that the babies might have obtained less milk from the second breast because they were nursing less vigorously. One of the babies on the chart which Dr. Smith had shown was not very vigorous and did not get enough nourishment. It might have been interesting to see what that baby would have done had it been fed by the tube. He had had a baby who was not vigorous, and while on the breast stopped gaining. He then put the baby on the tube and it began to gain. Possibly some of these breasts in the charts Dr. Smith had shown were not giving as much milk as they should on account of insufficient stimulation.

Dr. H. M. McClanahan, of Omaha, asked Dr. Smith whether he found any difference between the primiparae and the multiparae as regards the amount of milk the babies obtained. He was glad to hear this paper because the old rule was that babies should nurse 15 or 20 minutes, and it was well to know that they need not nurse this long to empty the breast.

Dr. Charles Herrman, of New York, said that several important applications might be made from these observations of Dr. Smith. They showed that most babies nursed too many minutes. In order that we might be sure that the baby was receiving a proper amount of milk, it was necessary to control by frequent weighings before and after nursing. There was no rule that was applicable at all times, even in the same baby. In hospital practice, a great deal of time was consumed by nurses who were in charge of bottle fed babies, because the hole in the nipple was made of such a size that it required from 15 to 20 minutes for the baby to take the milk. If this could be reduced to 8 or 10 minutes a great saving of time would result, and the nurses would be free to attend to other duties.

Dr. Royal Storrs Haynes, of New York, stated that there was a point in connection with the shorter nursing period which Dr. Smith had not mentioned though he was sure he had thought of it and that was that with the shorter nursing period there were fewer cracked and fissured nipples. At the Sloane Hospital they had no breast nursed longer than 8 minutes and since they had instituted this practice they had noticed an appreciable diminution in the number of cracked nipples.

Dr. Smith, in closing the discussion, said they had nursed the babies on one side and then on the other and then had reversed the procedure. As he had mentioned, there were certain mothers who had one Jersey and one Holstein breast, and some always gave more milk from the right than from the left breast. It was largely a matter of vigor; when they came to nurse the second breast they were not so hungry. In this study they made no distinction between primiparae and multiparae. They were after only one point and that was how long did it take the baby to empty the breast and how fast did it get milk. The quality of the breast milk was not investigated. What Dr. Herrman had said about the shorter period for bottle feeding in hospitals and the saving of the time of the nurses was worthy of note; the saving of time in feeding bottle babies with this shorter period was a very great help.

THE BASAL METABOLISM OF PREMATURITY.

STUDY II. RELATION OF BASAL METABOLISM TO CALORIC INTAKE AND WEIGHT CURVE.

Dr. Fritz B. Talbot, Dr. Warren R. Sisson, Margaret E. Moriarty and Alice J. Dalrymple, of Boston, presented this preliminary communication based on a study of the basal metabolism of 7 of the 22 premature infants studied by them in the past year and a half in its relation to the caloric intake and the weight curve. The subjects were all organically sound but had the characteristic appearance of premature infants, and so far as the writers had been able to determine, were prematurely born from 1 to 2 months. They had a high pulse rate, an unstable temperature and were too weak to nurse the breast at first. They were consequently fed by a Breck feeder or a tube and the precautions usually taken with the new-born were carried out. The technic used in this investigation was that previously described by Benedict and Talbot with some modifications. There was surprising conformity in the results, which were graphically shown in charts, and the writers feel that there was no more variation in the metabolism findings than has been previously obtained in the studies of new-born infants. The charts showed that the caloric intake per kilogram of weight was high. This was in keeping with the findings of previous investigators. The basal metabolism, on the other hand, was strikingly low, no matter how it was charted. This low metabolism seems to be dependent upon the fact that there is a small amount of active heat-forming tissue in these incompletely developed infants. This evidence is contrary to the generally accepted belief that small subjects with relatively large body surface produce more uniform amount of heat per unit of body surface than do larger subjects. Premature infants are so protected with blankets and hot water bottles that an excessive loss of heat is prevented. It is the writer's belief that they are unable to compensate for such a loss of heat, as evidenced by the subnormal temperature which results from deprivation of external warmth. It was further shown that the infants did not gain weight until they were able to digest close to 200 calories in one day. The only food which was assimilated completely enough to accomplish this was human milk. It was also found that a relatively large proportion of the food intake goes into new body tissue. The large excess of the caloric intake over the basal was necessary because of the relatively greater amount of growth essential for the normal development of these babies.

Discussion. Dr. Walter Lester Carr, of New York, stated that this scientific investigation had brought out the facts which they had observed clinically at the Manhattan Maternity Hospital last year. These premature babies as a rule did not do well at first on mother's milk. The babies that did not do so well on plain breast milk might be helped by giving them alternate feedings of sterilized water. Dr. Carr recalled that in a paper which he read last year he described how they regulated the temperature of the incubator with electric lights, and the arrangement by which the baby's head was outside the incubator so that the feeding could be carried out without moving the baby, thus conserving the baby's energy for, as the studies in basal metabolism had shown, the basal metabolism of these premature infants was low and their heat production defective. These observations had been confirmed by clinical observations, which had shown that it was best to avoid moving these infants, so they had used a Breck feeder or a medicine dropper and did not disturb the babies. They had found that the babies should be left in the incubator until they weighed 5 pounds. When they were taken out sooner they always had to be put back. When the babies reached a weight of 4 pounds they were taken out for a half hour at a time and put back again and this practice was continued until they weighed 5 pounds when they were sent out.

Dr. Julius H. Hess, of Chicago, asked Dr. Talbot whether they had kept track of the total fluids that these premature babies took. Dr. Carr brought out the fact that these babies did better when the breast milk was alternated with water; that meant that one obtained the best results when the milk was diluted. It had been their experience that nearly all these prematures could take a good grade of older breast milk, that was, breast milk from mothers 4 to 6 weeks post partum. With this milk the babies did quite as well as with the earlier milk. The important thing was to get sufficient fluids. They had found it almost impossible to give anything like the caloric needs of the babies during the first week or two, but, unless they gave one-seventh to one-eighth of the body weight in total fluids, the babies did not do well. The amount of fluid made a surprising difference in the amount of breast milk these babies could metabolize and a surprising difference in the results.

CELIAC DISEASE.

Dr. Rood Taylor, of Minneapolis, Minn., said that celiac disease is one type of chronic intestinal indigestion which has been variously named, the most commonly used titles being Herter's infantilism, intestinal infantilism and pancreatic insufficiency.

Of the 7 cases included in this study, the disease was preceded in 6 by a long period of malfeeding, and in 4 by a definite parenteral infection. Gastric achlorhydria was present in the 5 cases in which the stomach contents were examined. The duodenal juice was examined in 3 cases, and a pathological pigment, urobilinogen was found in one case. This was evidence of diffuse pathology in the liver. In a second case, there was a complicating Banti's disease, in a third case leucin and tyrosin were present in the urine, and in all the patients the liver was smaller than normal. These findings are introduced as evidence of involvement of the liver. The duodenal juice in all cases contained bile salts, and starch and protein splitting ferments. Examination of the stools in 4 cases showed fairly good fat splitting. Data was also included which presents evidence of the considerable therapeutic efficacy of lactic acid milk and dextrose in the treatment of this disease.

Discussion. Dr. W. McKim Marriott, of St. Louis, stated that their experience had been similar to that of Dr. Taylor. They had employed a type of diet not dissimilar in form to that used by Dr. Taylor, namely a diet consisting largely of protein. They took the curds of 3 quarts of milk and ground them up to make one quart. To prevent edema, they supplied cod-liver oil and vitamine which were ground into the mixture of curds. To supply additional proteins, scraped beef was added and also a sufficient amount of carbohydrate in the form of corn syrup, 1 to 3 ounces. To prevent scurvy, orange juice was added. To supply sufficient calories, somewhat above the amount that one would calculate from the weight and age were given. When they found that there were organisms in the gastrointestinal tract they added argyrol to make a concentration of 1-300. They had also resorted to transfusion with benefit. To meet the indications of an achlorhydria, they added HCl, but not in the amounts ordinarily used; 25 c.c. of normal HCl was the amount they had found necessary to bring the stomach contents to normal. The children responded well, so far as the symptoms were concerned, but they sometimes developed acidosis and this had to be eliminated.

Discussion. Dr. John Lovett Morse, of Boston, took exception to the adoption of this term celiac disease as though it was a special disease entity, which he did not think it was. What was being spoken of as celiac disease was a symptom complex which was common to several severe types of indigestion. It might be intolerance to fat; it might be intolerance to sugar or to starches, almost never intolerance to proteins. These cases could be treated much more intelligently if they were looked upon as cases of indigestion of some type than if they were looked upon as all one thing. One could then study the symptoms and the stools and determine for which food element there was an intolerance. One had then to fit the food to the digestive capacity, and to cut out fats in one case, the sugars in another, and possibly the proteins in another. We had to follow the stools and regulate the diet to meet the indications. Usually this meant to cut the fats; in bad cases, it might mean cutting the starches, and one of the best foods was that described by Dr. Marriott in connection with which he called attention to the usefulness of corn syrup. Corn syrup was especially useful in these cases, and curds also were most useful. The lactic acid milk he did not think amounted to so much. High protein counted for a great deal, and the scraped beef added a great deal. One must think all the time how much protein, how much starch, how much sugar and how much fat. Medicine counted very little; good nursing a great deal.

Dr. Henry Koplik, of New York, agreed with Dr. Morse that it was advisable not to consider the condition as an entity but rather a sympton complex. He put these children back on the diet which they were taking when they began to fail. He analyzed everything that was ingested and everything that came out of the body and found to what food element the disturbance was due. Each case must be judged by itself.

Dr. Isaac A. Abt, of Chicago, stated that he believed that this condition was a distinct clinical entity. These children had pronounced anorexia and absolutely refused food. The vast majority of them would do well on any kind of treatment for a time. They would do well for a number of weeks or months and then a catastrophe occurred of greater or less severity. Then, after a rest and a brief period of rational treatment, they recovered and went ahead for a while. Under any kind of treatment they would do well for a while and their digestive fatigue or some upset nearly carried them away. He had treated them by the use of the duodenal tube and had given immense quantities of pancreatic extract. Every kind of treatment was merely temporizing; as they grew older they overcame the trouble.

Dr. Rowland Godfrey Freeman, of New York, recalled that several years ago he reported 5 cases, one a very severe case in a child 1 year old, and in another, the bone formation was very defective. At one time the child broke both legs and at another time both bones of the forearm. She seemed to derive more benefit from pancreatic extract than from anything else and she was still taking pancreatic capsules 3 times a day. The mother stated that when the pancreatic extract was stopped the child did not do so well.

Dr. L. Emmett Holt, of New York, stated that the thing that interested him most in regard to these cases was the prolonged effect on growth. He had 2 cases under observation at the present time, one a child of 11 years. This child at the age of 4 years weighed 22 pounds; at the age of 6 years, she was 3 years below the average size. The symptoms were practically over when she reached the age of 7 years. Since that time she had grown at twice the usual rate and now, at the age of about 11 years, her weight for height was about normal. It was interesting how at a certain age these children became able to digest their food and if the condition had not continued too long they made up their growth, but in certain instances, where the condition persisted, the children were permanently affected as to their growth and development. In the management of these cases the most important factor was the control of the child and the establishment of regular discipline in the home. Unless this could be done the results were almost sure to be disappointing. Dr. Holt said that very few of his cases were due to fat intolerance. The speaker had mentioned that the potato was often to blame and that the large use of starchy foods was becoming a little too popular. There was a tendency to give an excess of starchy foods in the latter part of the first year and in the second year. When the carbohydrates had been pushed too far, one got better results with the sugars than with the starches and he had found that corn syrup worked very well. Most mistakes were made by excluding fats; these children could take fats if the fats were given in the carbohydrate and were not excessive. The important thing was infrequent feeding; these children should not be fed oftener than 3 times in the day. Another important point was the giving of large amounts of water, by clysis if necessary. In these cases the mistaken diagnosis of tuberculous peritonitis was frequently made, not so much by the pediatrist, as by the general practitioner.

EXPERIMENTAL STUDIES WITH PROPRIETARY VITAMINE PRODUCTS

Dr. Julius H. Hess, Dr. Josiah J. Moore, and Dr. Joseph K. Calvin, of Chicago, presented this study. They stated that because of the widespread publicity given the so-called concentrated vitamine products they deemed it of sufficient interest and importance, for both profession and laity, to make a study of some of these products to ascertain, if possible, whether the claims made for them were well founded.

The first study was made to test out the potency of metagen in regard to its antiscorbutic vitamine. One group of animals was fed on oats, hay and water. These developed scurvy on an average of 2 to 3 weeks after commencing the diet and, unless the diet was altered, died between 1 and 3 weeks after scurvy was diagnosed. Group II, receiving oats, hay and milk, developed scurvy in from 2 to 5 weeks and died in 3 to 6 weeks, unless orange juice was given. Group III, receiving oats, hay and water, plus 20 grains of metagen, in every instance developed scurvy in from 2 to 4 weeks and died of scurvy a few weeks later unless protected by adding orange juice to their diet. Group IV, receiving oats, hay and milk and 20 grains of metagen, all developed scurvy in from 2 to 4 weeks. The scurvy progressed to a fatal termination in all animals unprotected by the addition of orange juice to the diet in from 3 to 6 weeks. Group V, receiving oats, hay and water or milk, and 5 mils orange juice per day, gained rapidly and were well at the end of 2 months. The experiments showed that metagen as obtained in the open market contains no demonstrable amount of antiscorbutic substances as shown by experiments on the guinea pigs. The effect of the aging of this product after leaving the manufacturing laboratory might be of importance.

The second product studied was known commercially as vitamon. A series of experiments were made on groups fed on diets similar to those used in the foregoing observations and in Groups III and IV, 4 tablets a day, or two-thirds of that recommended for adult use, were fed to each guinea pig. The animals fed on a scurvy producing diet, plus vitamon, without exception, developed scurvy in from 14 to 16 days.

A third product, now in the process of experimental preparation, which contains dried orange juice and dessicated pig's liver, was investigated at the manufacturer's request. All of the animals on the larger doses of this product developed diarrhea, lost weight and finally died. It was their impression that this was due to a toxic effect of the product. The use of this product was started within 2 weeks after its receipt from the manufacturer.

The 3 products investigated were found to contain insufficient antiscorbutic vitamine to protect guinea pigs from scurvy when administered in quantities recommended as protecting doses for infants and children.

Studies on the antineuritic vitamine or water soluble B were carried out with metagen, vitamon, and yeast vitamine Harris, and the product containing orange juice and pig's liver. All pigeons fed on a diet of polished rice and water developed experimental polyneuritis on an average in 3 and 4 weeks. Those fed upon the same diet, but receiving 1 gram (1/12 of a cake) of fresh commercial yeast daily, remained free from the disease at the end of 3 months. A pigeon fed on metagen, as prophylactic treatment, remained free from signs of polyneuritis for a period of 10 weeks after which time the disease developed. Birds in which the disease had developed were cured by the administration of metagen but less rapidly than pigeons in a similar condition placed on fresh yeast. Pigeons on vitamon developed polyneuritis although less rapidly than the control birds, averaging about 6 weeks. Yeast vitamine Harris tablets prevented and cured polyneuritis in a manner similar to fresh yeast. In this experimental work the equivalent of 3 cakes of yeast was fed daily.

It was becoming firmly fixed in the minds of leading investigators that except to meet specific indications, as in times of famine and certain economic upheavals, such as war, that the best method of obtaining sufficient vitamines is through a proper selection of foods. Vitamines should be obtained from the dairy, the grocery and the market, instead of the drug store. The writers, therefore, conclude that it is highly improper to substitute a remedy for a faulty diet.

Discussion. DR. WALTER LESTER CARR, of New York, said he thought Dr. Hess's conclusions contained the gist of the whole matter. There was a preparation put out by an English firm which had been used by the British Army in India apparently to some advantage. This article was very similar to the beef preparations; it smelled and tasted like them and had the consistency of molasses. It had been found very effective in preventing scurvy, and was claimed to be an antiscorbutic. They had given this preparation to babies and found that 10 minims, or ¼ of a teaspoonful, was well taken but they had not found that it made any difference in the growth and nutrition of the babies. In the army, where fresh vegetables and milk were not available, it might do, but where fresh milk and vegetables could be obtained it was more logical to use them.

INDICATIONS FOR TONSILLECTOMY IN INFANCY AND CHILDHOOD

DR. HENRY HEIMAN, of New York, asserted that during the past few years there had been engendered in the minds of medical men an unbounded spirit of antagonism toward the faucial tonsils. Last year medical school inspectors in New York City recommended tonsil treatment for 49,230 children. If the problem were extended to the whole country, it would undoubtedly include more than a million children. The fact should be emphasized that tonsillectomy was quite a major operation. Its risks were very definite. Numerous serious complications had been reported and a large number had not been reported. The indiscriminate removal of the tonsils should be condemned. After outlining briefly the history of tonsillectomy, discussing the functions of the tonsils, and presenting an analysis of 200 cases observed in private practice in which the tonsils had been previously removed for a variety of reasons, Dr. Heiman formulated rational indications for tonsillectomy.

He stated that in his group of cases he had seen the development of a definite lung abcess, an acute otitis media, followed by a mastoid and 3 severe cases of pharyngitis after tonsillectomy. During the past 3 years there were admitted to the pediatric service of Mt. Sinai Hospital 7 cases of lung abscess, 7 cases of bronchopneumonia, and 1 case of lobar pneumonia which developed after removal of the tonsils. In inspecting their cases for removal of the tonsils and adenoids, we should be guarded by safe and conservative principles: (1) if obstructive symptoms (mouth breathing and snoring at night) were present with evidence ot high arched palate, as the cause of obstruction, the adenoids should be removed; (2) if there was a persistent nasal discharge that did not yield to the usual therapeutic measures and in the absence of a sinusitis, then adenoidectomy should be performed; (3) if the tonsils were sufficiently large to cause obstruction, difficulty in breathing or swallowing, tonsillectomy was indicated. One must not be mislead, however, by the presence of a large tonsil that appeared to be obstructive, a tonsil that was rather pushed out toward the median line by the presence of a deep cervical adenitis. The writer had described these cases of parapharyngeal adenitis, which occurred most commonnly after grippe, scarlet fever and measles; (4) if the frequent occurrence of tonsillitis had produced definite disease in the tonsils, as evidenced by irregularity, raggedness, and friability, tonsillectomy was indicated; (5) if there were recurrent accumulations of cheesy material in the crypts of the tonsils, or if, on pressure, this might be extruded from the tonsils, with the presence of a foul odor of the patient's breath and symptoms of toxic absorption, the tonsils should be removed; (6) in cases of persistent cervical adenitis following tonsillitis, whether of pyogenic or tuberculous origin, tonsillectomy was indicated. These were the rules the writer laid down, but each case must be studied individually, and the advantages and risks considered before operation. Tonsillitis alone, or when associated with other conditions, was usually but a manifestation of systemic infection. If the infection became generalized, it occurred in spite of the tonsil, not because of it. A careful sifting of the material and critical observation of the cases could not but lead one to the conviction that the tonsils had a definite function to perform. In their enthusiasm over tonsillectomy, these were frequently entirely disregarded. In conclusion, Dr. Heiman urged the coöperation of the members of the Society to banish the passionate desire to remove every tonsil and to substitute more conservative and rational principles.

Discussion. DR. EDWIN H. PLACE, of Boston, stated that his experience had led him to quite different conclusions from those reached by Dr. Heiman. There was a good deal of evidence to show that the function of the tonsil was open to some doubt, and as to its protective function he thought the evidence was the other way. Dr. Heiman's paper had interested him because they had had a considerable number of patients who had had their tonsils removed for scarlet fever. There was some evidence that the tonsils were the point of attack in scarlet fever. If the tonsils were removed, the fever dropped by crisis and the disease continued in an extremely mild form. The evidence here, however, was not such that one could say that the tonsils should be removed in scarlet fever.

DR. HENRY KOPLIK, of New York, said there was no doubt that the whole procedure with reference to the tonsil had been accompanied by a horde of unskilled operators. Every man who wished to operate on the tonsils was not competent to do so. If we examined the throats of those who had had operations on the tonsils, we could get an index of the capacity of the operators. There had been a decided effort on the part of laryngological societies to try to remedy the defects in tonsil operations and to avoid accidents during anesthesia and operation. It was important that the patient be prepared not to expect too much from tonsillectomy. Dr. Koplik always told his patients that tonsillectomy would not remove a cough or colds or other conditions, but there was no doubt that the presence of pus and bacteria in the tonsil was always a danger but just what the danger was we do not know. It might lead to rheumatism or endocarditis. As the reader of the paper had said, we should study the tonsil before it was removed and see whether it should be removed or not. A great many tonsils look very innocent. They were pale and not very large and they did not seem to be a menace, but if one examined them he found them imbedded and finds the glands on each side of the throat enlarged. These glands were infected. Tonsils that caused enlarged lymphatics were infected, but if a tonsil simply looked large there was no reason why it should be taken out, if it was not infected and was not causing obstruction.

Dr. H. M. McClanahan, of Omaha, said that in all cases in which a child had a high arched palate the removal of the adenoids did not correct the trouble. As to the removal of the tonsils he could not speak for the East, but in Omaha they had had a wave of tonsillectomy beyond belief pass over the city. There had been as many as 100 tonsillectomies in one week in that city. He felt very keenly and deeply that the family physician or the pediatrician is the man to decide whether the tonsils should be removed. In saying this he did not mean to cast any reflection on the laryngologists, but they were not in a position to know the patient's general condition as does the pediatrician or the general practitioner. When there was present cervical adenitis, rheumatism or any infectious process, whatever might be the function of the tonsils, they were no longer performing it and should be removed. As to the bad results of tonsillectomy, during the past year he had seen mastoid disease follow upon the removal of the tonsils, and he had seen 2 cases of severe hemorrhage, one of which nearly resulted in a loss of life. He thought our patients should be made to understand that tonsillectomy was really an operation which involved risk and should not be entered upon until its necessity had been demonstrated, and so he thought the doctor had presented a very practical subject.

Dr. L. T. Royster, of Norfolk, Va., said that in Virginia they had rural clinics for the treatment of tonsils. One or more laryngologists with nurses and an anesthetist operated on all the children rounded up for this purpose. These cases were passed upon by nurses, not that he would disparage the work done by visiting nurses, for the nurses' work was a great thing and he should not want to belittle it, but these cases were not passed upon by a physician. They were simply enlarged tonsils or appeared to be so to the nurse. In the absence of any distinctive symptoms, a large tonsil was not an indication for operation. A buried tonsil was more of a menace. There were 2 or 3 definite indications for tonsillectomy. If the tonsil had lost its crypts, it should be removed. If it had lost its anterior sulcus and had adherent pillars and had been inflamed, it should be removed. Such tonsils might exude pus or they might not, but they had been infected. Likewise the so-called moth-eaten tonsils had been infected and were a menace. In cases of malnutrition Dr. Royster had never obtained good results from removal of the tonsils. No child should be subjected to the risk of tonsillectomy until he had been examined for definite indications, or perhaps what was more important for the definite absence of indications.

Dr. Charles Herrman, of New York, stated that some years ago he was a medical school inspector. In the routine examination of the children they were expected to find that from 20 to 25 per cent. had enlarged tonsils; if a smaller number were recorded, it was thought that the examinations were not sufficiently careful. If enlarged tonsils and adenoids were found, the parents were notified. The nurse then visited the home to see that the child had received treatment, and repeated her visits until such treatment had been given. The result was that a certain number of children were subjected to tonsillectomy in whom the operation was not necessary. If he understood Dr. Heiman correctly he stated that the presence of a high arched palate and a sinusitis were contraindications to operative interference. Although patients with a high arched palate, for instance, mongolian imbeciles, could not be entirely relieved of their obstructed nasal breathing by operative procedures, they certainly could be improved. The same held true in patients with a persistent nasal discharge and sinusitis. The latter would require special treatment, but the removal of adenoid vegetations, if present, would help to effect a cure.

Dr. Isaac A. Abt, of Chicago, said the paper had been thoroughly discussed, but he wished to add one more indication for tonsillectomy. If there was a reasonable doubt after mature deliberation, and after both a laryngologist and a pediatrician or general practitioner had studied the case, the child should be given the benefit of the doubt and the tonsils should not be removed.

A CLINICAL AND PATHOLOGICAL STUDY OF BRAIN TUMORS IN YOUNG CHILDREN.

Dr. Frederic H. Bartlett and Dr. Martha Wollstein, of New York, presented this study from the Babies' Hospital. They stated that among 4,563 autopsy records at the Babies' Hospital, there were 9 cases of neoplasm of the brain. This makes an incidence of 0.2 of one per cent., which is rather less than the 1 per cent. recorded for the occurrence of brain tumors among adults. There were 2 girls and 7 boys, and their ages ranged from 2 weeks to 3 years. A detailed study of 7 cases was presented in this paper. Of these, 5 neoplasms were located in the cerebellum, constituting infratentorial tumors, and 2 in the cerebrum, constituting supratentorial tumors. All 5 infratentorial tumors involved the vermis and extended into one lobe of the cerebellum, compressing the other lobe; all had distorted the medulla; 3 had compressed the upper cervical segment of the spinal cord; one had compressed the pons as well as the medulla; one had extended into the pons and was accompanied by a cyst in the fourth ventricle; and another involved one of the cerebellar pontine-peduncles. None gave rise to metastases in other organs. The tumors were all large, measuring from 4 x 3.5, to 9 x 10 cm. in diameter. They were situated under the pia, which was deep red or reddish blue over the growth; were very vascular, containing small hemorrhages and areas of necrosis. Hydrocephalus was present in all 5 tumors. Histologically all 5 infratentorial neoplasms were gliomata of the astrocytoma type.

The 2 supratentorial tumors were dissimilar in location and in structure. One case involved the corpora striata, optic thalami and the corpora quadrigemina. Histologically this tumor was a glioma. The second supratentorial case occurred in so young a child (first symptoms being noted at 2 weeks of age) that the congenital nature of the growth can scarcely be doubted. Histologically this tumor was a glioma sarcomatodes, or gliosarcoma. Only one of these children presented a malformation in another organ than the brain. In this instance a boy, whose glioma involved the basal ganglia, had a horse shoe kidney. The average age of the children reported in this series is about 15 months. This places the time of the appearance of the tumor in the period of infancy.

There was every reason to believe that so far as the infants of this series were concerned, the brain tumors had grown to a considerable size before they gave symptoms that attracted one's attention. When the new growths reached a size to give physical signs the symptoms were comparable to those in adults, e.g. spasticities, increased reflexes, focal paralysis, etc. Two symptoms commonly associated with brain tumor were vomiting and convulsions. Vomiting occurred in 3 of the 7 cases as an early symptom. While the patients were under observation in the hospital none presented any unusual frequency of the vomiting nor was the vomiting of an explosive type. Convulsions occurred in only one instance in this series, and in that case a convulsion occurred a few hours before death. As convulsions in brain tumor are frequently mentioned in text-books on infants and children, it is desirable to call attention to their non-occurrence in the infants reported in this paper. Infrequency of vomiting and convulsions in the infants in this series may possibly be explained by the gradual increase in intracranial pressure and by the extreme adaptability of the young brain tissue to pressure gradually applied. Given this gradually increasing pressure on a space which is distensible, i.e. in a partially closed cavity, the skull, it seems reasonable to assume that the effects of compression expressed in vomiting and convulsions are delayed.

The spinal fluids obtained on lumbar puncture in these 7 cases varied in amount from 5 to 30 c.c. The pressure was increased only when the cases were seen early. Later in the disease the pressure was not increased. The fluid was clear, colorless, except in one case, in which it was yellow. The cells were increased in only one case. In the other cases they varied between 5 and 24. Globulin was not increased, except in the case in which the fluid was yellow; in this case the cells increased and the globulin increased in amount. The fluid in this case was blood-tinged at autopsy which was explained by the comparatively large amount of hemorrhage and necrosis in the tumor. The presence of the blood would explain the increased number of cells and the increased globulin in this case.

Discussion. Dr. Charles Hunter Dunn, of Boston, said he had 4 or 5 cases of brain tumor come to autopsy at the Children's Hospital. All were very much like the cases Dr. Bartlett had reported. Four of the tumors were cerebellar and 2 originated in the basal ganglia. None of the children showed convulsions. In most of these cases the tumors originated in the cerebellum or basal ganglia, and did not cause convulsions. He had seen only one successful operation for a brain tumor in a young child 2 years of age and in that case the tumor was cortical in origin and convulsions were the first symptom. It is only in the cortical tumors that convulsions are an early symptom.

APLASTIC ANEMIA WITH A REPORT OF A CASE IN A CHILD FOUR YEARS OLD MARKEDLY IMPROVED BY TRANSFUSION.

Dr. Charles Herrman, of New York, stated that the case was that of a girl 4 years of age, admitted to the hospital, November 4, 1921, with the history of fever and pain in the abdomen for the past 2 weeks. Examination on admission showed asthenia, marked pallor, puffiness of the face, and ecchymotic spots on the left calf. The temperature was 101°; pulse 150; respiration 30. The blood: hemoglobin, 25 per cent.; R.B.C., 750,000; W.B.C., 2500; polys., 25 per cent.; lymphos., 75 per cent. On November 5, a transfusion of 380 c.c of blood was given. This was followed by gradual but progressive improvement. The child became less asthentic, less irritable, and the appearance and appetite improved. There was occasional rise of temperature to 105°, without visible cause. On November 7, the blood examination showed the following: hemoglobin, 45 per cent.; R.B.C., 2,330,000; W.B.C., 2400; polys., 22 per cent.; lymphos., 68 per cent.; moderate polychromatophilia, poiklocytosis, macrocytes. The platelets numbered 170,000. There were no normoblasts or myelocytes. On December 3, hemoglobin, 65 per cent.; R.B.C., 3,800,000; W.B.C., 6000; polys., 47 per cent.; lymphos., 53 per cent. The patient was discharged on December 13 very much improved. In the latter part of December she had a mild attack of tonsillitis from which she recovered without any apparent injurious effect on her general condition or blood. She was readmitted to the hospital on March 26, 1922, and discharged on April 22. She died on April 25 and no autopsy was permitted.

About 80 cases of this condition had been reported. Of these, 21 occurred in children. Dr. Herrman presented an analysis of these cases. He felt that no doubt with more careful observation and hematologic study the disease would be found to be less rare than the number of reported cases would seem to indicate. About an equal number of cases had occurred in each sex; in children, however, about twice as many cases occurred in males as in females.

A number of different names had been given to this condition by different authors, as aregeneratory anemia, hemolytic aplastic anemia, aleukie hemorrhagica, toxic paralytic anemia or toxic anhemopoietic anemia. However, the term aplastic had been so generally used that it seemed best to retain it.

The most generally accepted explanation of the condition was that it was a primary lesion of the bone marrow due to the action upon it of some unknown toxic material. This resulted in a deficient production of blood cells, red cells, polymorphonuclear leucocytes, platelets and myelocytes. There was no definite evidence that the reduction in the number of red cells was due to increased destruction.

Characteristic changes were found in the skin, mucous membrane, liver, and spleen; and pathognomoic changes in the bone marrow. The bone marrow was largely replaced by fat and connective tissue, which gave it a yellow color and a peculiar consistency. On examination the marrow showed an absence of normoblasts, megaloblasts, and myelocytes, the predominating cells being lymphoid.

The disease manifested itself by anemia, shortness of breath and general weakness. The skin and conjunctivae were not yellow; the former was grayish-white; the conjunctivae had a bluish tinge. A puffiness of the face, more particularly of the eye-lids was frequently noted. There might be pain in different parts of the body but there was no definite pain on pressure over the bones. Fever might be present. There was usually a distinct hemorrhagic tendency, as shown by petechial spots on the skin, and in many cases hemorrhages from various mucous surfaces.

In a fairly typical case it should be possible to make a tentative diagnosis during life, from the anemia with its characteristic blood changes, but an absolutely certain diagnosis must of course rest on the finding of the pathognomonic changes in the bone marrow as revealed by necropsy. The disease from which it was most important and difficult to differentiate it was pernicious anemia. Pernicious anemia is exceedingly rare in young children. In many of the reported cases the diagnosis is doubtful. A table with the points of aid in differentiating pernicious anemia, aplastic anemia and purpura hemorrhagica was presented. In pernicious anemia there is a hyperplasia of the bone marrow; the production of new cells fails to keep up with their destruction. In aplastic anemia there is aplasia, or at least a hypoplasia of the marrow, a deficient production of new cells, but no evidence of increased destruction. In pernicious anemia there is a marked deposit of hemosiderin in the liver and the body fat is canary yellow; in aplastic anemia there is rarely a hemosiderin deposit, and the body fat is not canary yellow. Most authors considered the disease as invariably fatal.

In the treatment, preparations of iron, so valuable in other forms of anemia were of little or no value. A few patients had been somewhat benefitted by injections of arsenic. Preparations of bone marrow had been given without favorable effect. Radiation of the bone with the roentgen ray might be injurious rather than beneficial. The best method of treatment at command at the present time was the transfusion of whole blood. The investigations of Unger and others would seem to make it advisable to use the blood without the addition of sodium citrate. From 300 to 500 c.c. are usually given, and repeated if necessary. If, after a temporary improvement, the blood rapidly tended to return to its previous condition, the outlook was unfavorable; however, if a slight but progressive increase in the percentage of hemoglobin, in the number of red blood cells, in the polymorphonuclear leucocytes and in the platelets took place, the prognosis was not unfavorable. In such cases there were probably still some small areas of normal marrow which might be reactivated so that the patient was tided over the danger period. Splenectomy had been performed in 1 or 2 cases with unfavorable result. It appears to be contraindicated.

Discussion. Dr. Rood Taylor, of Minneapolis, made the point that it was very doubtful whether pernicious anemia ever occurred in infancy and childhood.

Dr. Alfred Hand, of Philadelphia, said Dr. Herrman's report reminded him of a somewhat similar case seen recently, with the difference that transfusion was of no influence apparently. In his patient the blood picture was like that of Dr. Herrman's, except for a higher leucocyte count, about 30,000, and the effect of transfusion, bringing the hemoglobin up during operation to 85 per cent., was so transient that by the next day the reading was 20 per cent. The diagnosis in his case was in doubt because of the inability of 2 competent hematologists, who saw the patient and studied the slides, to agree in the interpretation, one viewing it as an aplastic anemia, the other being positive that the mononuclear cells which predominated, up to 98 per cent., were largely promyelocytes and that the disease was acute myelogenous leukemia, to which latter diagnosis support was lent by the failure of transfusion and the rapidly fatal outcome.

Dr. John Lovett Morse, of Boston, stated that during the past winter he had been collecting the cases of severe anemia and aplastic anemia which he had had for the past 25 years and he could recall but one case of myelogenous leukemia. He had had 11 or 12 cases of acute lymphatic leukemia and perhaps 12 or 13 cases of severe anemias. There had also been a number of borderline cases that shaded off. In looking at these blood conditions the thing to do was to think where the different blood corpuscles were made and then to see what part of the blood-forming organism was at fault. One should never be satisfied with the differential percentage of the white corpuscles but should figure out the exact polymorphonuclear count. Dr. Morse said he was not sure whether this case of Dr. Herrman's deserved the name of aplastic anemia as the term was applied to adults; he should not like to commit himself and should prefer to call it severe anemia in childhood. A great many of these cases had enlargement of the liver and spleen and a great many had enlargement of the lymph nodes; a considerable proportion had hemorrhages, others did not. One characteristic was that they were well nourished. Dr. Morse said the progress of the disease in his cases was more rapid than in Dr. Herrman's case. They usually died in about 6 weeks; only 2 lived for 6 months. He thought these cases were almost uniformly fatal. From the history of the cases he thought there must be some sort of intoxication at the base of the trouble, but what kind of an intoxication it was he could not say. The general treatment should be directed toward the elimination of the toxemia and possibly one might hit upon the cause of the trouble, but nothing in the way of iron and arsenic did any good. Some cases were temporarily improved by transfusion. His feeling, however, was that, if a case got well after transfusion, it was probably not this kind of an anemia but a case of purpura.

Dr. Herrman, in closing the discussion, stated that in a certain number of cases of severe anemia the diagnosis might be in doubt unless corroborated by an autopsy. In aplastic anemia the characteristic changes in the bone marrow must be present. Dr. Herrman agreed with Dr. Morse that the name aplastic anemia was not a good one. In a recent paper Thursfield suggested "anemia gravis" for the group. Pernicious anemia was a very rare disease in early childhood. In looking over the literature he had found that some of the cases reported as such, in which no autopsy was performed and in which there was a marked reduction of polynuclear leucocytes and no nucleated red cells, were probably cases belonging to this group of aplastic anemia. If the patient was under observation for only a short time, the differentiation from a aleukemic phase of a chronic lymphatic leukemia might be very difficult. The absence of nucleated red cells, indicating absence of activity on the part of the bone marrow, was an important diagnostic point. Intercurrent infections, especially of the throat, seemed to be especially harmful in the cases of severe anemia and on this account it was well to separate them from other children in the hospital ward. The only child with a true aplastic anemia who recovered appears to be one reported by Parkinson.

LUCILIA, THE UBIQUITOUS PARALYSIS-FLY AND ITS ALLY, THE BUZZARD.

Dr. E. W. Saunders, of St. Louis, stated that there was abundant proof from several scientific centers that lucilia is the obligate host of a botulinoid organism, a toxi-virus which paralyzed and kills any vertebrate so far experimented upon, to wit, any species of bird, quadruped or reptile (both venomous and nonvenomous). The "lucilia epizootic" was primarily an avian disease. Poultry require very large lethal doses, and might recover either completely or partially with residual paralysis after large doses of toxi-virulent larvae. On the other hand, guinea pigs never recovered from the smallest toxic doses. Dr. Saunders raised the query whether it was incumbent upon the advocates of lucilia causation of human polomyelitis to prove that man was admittedly accessible to lucilia, was susceptible to its toxi-virus, or whether it was obligatory upon despisers of lucilia's claims to prove that man alone of all vertebrates was unsusceptible. The universal distribution of lucilia from the equator to the poles; its extreme hardihood; its activity in human and animal habitations, when the thermometer without was 40° below zero; its habit of depositing its paralysant ova indifferently upon animal or vegetable matter, either fresh or in a state of putrescence, in this particular differing from other carrion flies, all incriminated this insect. This species of fly had an eradicably wild nature and refused to propagate in captivity. The buzzard, the sacred bird of America, was protected by law in every state, in spite of the fact that it had been proven guilty of carrying disease germs over whole continents. To its activity was due the destruction of all the cattle amongst the Barotso tribes of Central Africa by rinderpest, and the extermination of the water buffalo in the Philippines. It conveyed cholera germs all over India, until the government abolished the Towers of Silence where the Parsees deposited their cholera dead, to be devoured by the birds. It had carried the various cattle diseases over all the states of the Union. There was necessity for immediate destruction of this bird of evil omen by the Federal Government; this could be done within a week. As it was an interstate carrier it was absolutely under the jurisdiction of the Federal Government.

REPORT OF A CASE OF CONVULSIONS AND MILD OR PSEUDO-PETIT-MAL, IN A BOY DUE TO GENITAL IRRITATION.

Dr. Henry T. Machell, of Toronto, reported this case which occurred in a boy 4 years of age, one of twins. He was seen by the writer's locum tenens on July 10, last. At that time he had 5 convulsions in all, scarcely regaining consciousness between them. At the first visit his temperature was 103°; pulse 140 and respiration 60. The cause of the convulsions seemed to be between cerebrospinal meningitis and lobar pneumonia with intestinal toxemia as a third possibility. A lumbar puncture showed nothing abnormal, neither did a physical examination of the chest. After one week he was much improved. The writer did not see the patient until the middle of September, when the mother said that the boy had been out playing but not with his accustomed energy. She also stated that for practically the whole of the month of September he took "spells" or turns from 2 to 3, up to 10 or 15 times per day. He would look dazed, stare at an object for a few seconds and then resume play. At the time he would stare, shudder or twitch, his head would fall forward, his chin would touch his sternum, then he would rouse up. At other times his head would drop forward on his chest and he would fall on his face or forehead. Apart from these "spells" he was unsteady on his legs, often falling, then at other times recovering himself before going down.. With all these falls he uttered no cry, did not lose consciousness, bite his tongue or go to sleep afterwards. Two or three times he passed urine involuntarily.

During December these petit-mal attacks became more frequent and more severe. With the view of having him more constantly under supervision he was sent to the Hospital for Sick Children, under the care of Dr. Boyer, the neurologist. It was found that in 96 hours barium was still present in the large bowel; in 72 hours the appendix and cecum still contained barium. An x-ray of the skull was entirely negative. The cerebrospinal fluid showed no findings whatever of irritation. From the result of his stay in the hospital the only positive findings were the intestinal stasis. The prognosis was considered bad, and it was thought that his condition would eventuate in a severe epilepsy.

On February 15, 1922, the writer was sent for in great haste. Not being at home the nearest doctor was sent for. He was told on his arrival that the patient had had pains all morning, particularly when he attempted to urinate. On investigating the penis and foreskin, they looked normal, but upon pulling back the foreskin with little or no difficulty and after separating adhesions with a probe, a roll of smegma about an eighth of an inch in diameter and nearly three-quarters of an inch long was removed. Since then the child has had no crying or screaming turns or petit-mal attacks. He is moreover picking up in intelligence and is learning how to talk more plainly, and to play with toys.

On April 7, the writer was again asked to see the boy as he had been having from 2 to 15 falling attacks for about 3 weeks. On examining the foreskin, free adhesions were found particularly over the corona with only a small amount of smegma. The mother states that his "spells" are of a milder type and somewhat less frequent than a month or two ago. It would seem that the theory that his attacks are due to genital or intestinal irritation must be abandoned and one must fall back on the original or petit-mal theory.

XANTHOMA TUBEROSUM WITH DIABETES INSIPIDUS.

Dr. J. P. Crozer Griffith, of Philadelphia, reported this case which occurred in a boy of 9 years, who came to the Children's Ward of the Hospital of the University of Pennsylvania on September 21, 1921, on account of "yellowness" and swelling of the abdomen. Enlargement of the abdomen was noted at 3 years, but was temporary. Apparently in good health until January, 1919, except for poor nutrition. At this time an attack of jaundice from which he recovered in 2 or 3 weeks. Over a year later, in April, 1920, a fall on the head was followed by a lump which disappeared, but soon another developed which was excised and the bone was scraped. This was in September, 1920, 5 months later. Injections of mercuric chloride started, on the ground of possible syphilis; this in October, 1920. A few days later icterus developed, abdomen became enlarged, the liver also enlarged, debility and emaciation came on, and these symptoms have continued. At the same time small nodules appeared on the skin of the palms and the neck, and these spread more or less over the body. In the summer of 1921 polydypsia and polyuria developed. His weight was 32 pounds, 10 ounces. There was universal jaundice; some nodules on the skull, particularly as shown by x-ray examination. Parchment yellow papules and maculopapules, especially about the nose, mouth, eyelids, side of the neck, axillae, palms, flexor and extensor surfaces of the limbs; and large and abundant about the knees. Liver found distinctly enlarged, both upward and downward; spleen also enlarged and felt 4 cm. below the costal margin. Blood-pressure was particularly low,—78 systolic and 58 diastolic. Amount of urine varied from 5,000 to 8,000 c.c. daily. Under the administration of sodium chloride, it rose to 10,000. The specific gravity was always low, usually below 1,007. Pituitary extract given by the mouth had no effect, but the obstetrical preparation of pituitrin given hypodermically, 1 c.c. daily, reduced the amount of urine to normal, but did not affect its specific gravity. A study of the basal metabolism showed nothing abnormal. There was no reduction in the amount of hemoglobin or of the red blood cells; a slight leucocytosis; an increased resistance to hypotonic salt solution; blood-sugar was 0.06 per cent., blood cholesterol 397 mgm. to 100 c.c. Wassermann, negative. Faeces contained no bile pigment; an excess of fat. A phenolsulphonephthalein test of urine gave 25 per cent. excreted the first hour; 10 per cent. more in the second. Child in the Hospital 2 months, and left with little change in his condition.

The case was of interest for the following reasons:—(1) the uncommonness of xanthoma tuberosum; (2) the extreme rarity of jaundice as a symptom of it in childhood; (3) the remarkable combination of xanthoma with diabetes insipidus; (4) the confirmation by the saline test of the view that in diabetes insipidus there is an inability of the kidneys to concentrate the urine; (5) the fact that pituitrin, although diminishing the urine did not increase the specific gravity.

A PECULIAR CASE OF PURULENT MENINGITIS IN THE NEW-BORN.

Dr. DeWitt H. Sherman, of Buffalo, stated that this case was unusual in that the exciting agent belonged to the group of bacillus lactis aerogenes, and that the isolated bacillus could not be identified with any known pathogenic organism. The intestinal origin of the infection was corroborated by the pathological changes found in the liver. The center of the lobules containing the hepatic veins was normal on section, but the periphery of the lobules containing the terminal portal blood vessels, which drain the intestinal canal, showed more or less marked degenerative changes, some areas showing a commencing necrosis similar to that seen in phosphorus poisoning.

The pathogenesis of this bacillus was shown by its effect upon mice, in which it caused death in 12 hours or so, and in these mice it produced a distinct inflammation of the cranial meninges.

The history of the case was as follows: The baby was born on November 12, 1921, a breech presentation. Some, but not unusual, traction in delivery was used. As the child did not breathe promptly, the anesthetist inserted his finger into the mouth to remove any obstructing mucus. With this one exception the mouth was treated aseptically. Mild measures to overcome asphyxia neonatorum were soon followed by good results.

Nothing unusual was noticed until the baby was 3 days old, when it had its first convulsion, and developed a temperature per rectum of 104°. After the first convulsion, the nurse noticed a tonic contraction of the right arm, which was held close to its side with contraction of the flexor muscles of the forearm, causing flexion of the hand on the wrist and also of the fingers, a condition resembling tetany. This persisted more or less markedly as long as the child lived. From the onset of the convulsions on the third day until the sixth day of its life, it had numerous, at periods continuous, convulsions. On the last day of its illness, in spite of the continued administration of bromides, the convulsions recurred, and it died on November 19, at the age of 7 days.

On the day before its death the baby developed Cheyne-Stokes respiration with cyanosis. Its cry often, but not always was hydrocephalic.

The diagnosis was meningitis, probably hemorrhagic. The autopsy showed a hemorrhagic, suppurative leptomeningitis of the left convex surface and of part of the base of the brain, and also of the spinal cord.

The autopsy was performed by Dr. Benjamin Roman, of Buffalo, whose complete report was included with that of the case, together with the histological and bacteriological report. The smear from the meninges showed exclusively and abundantly Gram-negative bacilli of varying length and thickness, some coccoid in form, others pretty long with bipolar staining, some lying within, but most of them without the pus cells. So far the bacillus could not be identified with any of the known pathogenic organisms. In addition to the suppurative leptomeningitis, there was an acute catarrhal gastroenteritis, acute hepatitis, degeneration of the heart and kidneys, and acute swelling of the spleen.

Discussion. Dr. Henry Heiman, of New York, said it was rather interesting to note how many varieties of bacteria could produce meningitis. He believed that almost every pyogenic organism and also the tubercle bacillus had been found in the spinal fluid. Recently he had seen 2 rather unusual kinds of meningitis. In one case, they encountered the streptococcus hemolyticus and in the other, a diphtheroid organism, both with recovery of the patient. It was unfortunate that Dr. Sherman was not able to prove his case to be due to the bacillus lactis aerogenes, because one would question whether the infection was not a post mortem one though the changes found in the brain and liver bespoke an antemortem infection.

AN UNUSUAL CASE OF MEDIASTINAL TUMOR.

Dr. Thomas B. Cooley, of Detroit, stated that this patient, a boy aged 7 years, was admitted to the Children's Hospital on February 2, 1922, with a history of having had a sudden attack of severe dyspnea the night before. The hospital records showed that he had been admitted for a few days in the fall of 1919, with a diagnosis of "bronchitis." Nothing was noted at that time except that the breathing was labored.

The family history as obtained from the parents was entirely negative. Examination showed a medium-sized boy, pale and rather thin. Respiration was somewhat rapid and labored, with frequent cough. The left upper chest seemed fuller than the right, and there was a plexus of enlarged and congested superficial veins in this region. Measurement showed the left side to be 1½ cm. greater in circumference than the right at the axillary level. No cardiac impulse was visible. Examination was negative except that one pea-sized node was found in each axilla.

Percussion of the chest revealed an area of pronounced dullness extending from just outside the left nipple line nearly to that on the right, with fairly straight borders, and reaching from the level of the clavicles to the diaphragm line. The greatest transverse diameter was 12 cm. On auscultation the breath sounds were greatly diminished.

X-ray examination of the chest showed an area of pronounced density corresponding very closely with that outlined by percussion. The mass seemed to fill more than half the thorax. The borders were sharp but seemed slightly scalloped. The tumor seemed to extend unusually high for mediastinal Hodgkin's disease. The blood count was as follows: hemoglobin, 80 per cent.; R.B.C., 4,200,000; W.B.C., 11,680; polys., 62 per cent.; l.l., 6 per cent.; s.l., 32 per cent. The blood Wassermann was negative.

A provisional diagnosis of Hodgkin's disease, thymus or lymphosarcoma was made. One of the axillary nodes, removed later, showed nothing characteristic histologically.

On each of 2 nights following admission there was a grave attack of dyspnea, the second nearly fatal. On account of these, it was decided to resort to intensive x-ray treatment without further study. Fluoroscopic examination at the time of the first treatment revealed a walnut-sized mass in the epigastrium, near the median line which was believed to be a gland.

For treatment, the chest was divided by cross lines into 4 areas, which were exposed to the rays successively. The dosage was 90 K.V., 5 m.a., 7 minutes at 8 inch skin target distance, with a 4 mm. aluminum screen. After the whole area had been covered from the front, the back was given a single exposure. After 2 weeks rest, one more anterior and one posterior exposure was made. There were no more attacks of asphyxia after the first treatment. After 3 treatments a radiograph showed the area of density to be about 5 cm. narrower, and distinctly less dense. The findings by percussion agreed with this. Breath sounds were better heard and the heart sounds distinct where they had been obliterated.

When last seen, on April 21, the boy had gained 7 pounds, had rosy cheeks and abundant energy, and his white blood count, which had been from 11,000 to 13,000, had fallen to 8,000. The distended veins over the left chest had disappeared during his stay in the hospital and the 2 sides of his chest were now equal. The roentgen findings were now practically normal.

The writer believed this to be Hodgkin's disease or lymphosarcoma on account of the size and probably rapid development of the tumor in a child previously healthy, and because of the variation in the density of the shadow. He could not, however, definitely exclude a very large hyperplastic thymus gland though if this had been present the conspicuous venous plexus should have been observed during his previous stay in the hospital, even if dullness were missed; or the thymus may have been sarcomatous.

FACTORS CONCERNED IN THE CALCIFICATION OF BONE.

Dr. John Howland and Dr. Benjamin Kramer, of Baltimore, presented this communication, which pointed out that calcification consisted essentially in the deposit of calcium phosphate in the cartilage and bone. To bring about this deposition a certain minimal concentration of calcium and inorganic phosphorus must be present in the serum. The concentration of these substances in the serum of rachitic children had been determined. Evidence of calcification had been obtained by radiographic and anatomical studies. By comparing the information gained in these different ways, it was possible to say that failure of calcification might result from a diminution of calcium or of phosphorus or both of these in the serum and to state approximately the limit of concentration below which calcification did not occur.

THE SIGNIFICANCE OF CLINICAL, RADIOGRAPHIC AND CHEMICAL CHANGES IN THE EARLY DIAGNOSIS OF RICKETS.

Dr. Alfred F. Hess, of New York, said his hearers would probably agree with him that the diagnosis of rickets was becoming increasingly difficult. Some years ago we felt that we could diagnose it; today we realize that rickets was essentially a systemic disease and it has become very difficult to know whether it is present or not.

For the past 4 or 5 years he had had the opportunity to follow a number of infants month by month and to note the signs of rickets as they developed on different diets. For the past 3 years they had made roentgenographs every month of the wrists of the children under observation. For the past year or more they had estimated the inorganic phosphate of the blood as suggested by Howland and Kramer. They had found the clinical signs of rickets very variable. For instance, the development of the teeth was not to be relied upon, since in some children with rickets they develop early and in others late. Even if one gave cod-liver oil he could not bring about the development of the teeth. It had been observed, however, that when the child was backward mentally it did not develop teeth early. The question of when the child began to sit or stand, the question of musculature, and of craniotabes were all unreliable as signs of rickets. The best clinical sign of rickets was beading of the ribs. They had classified beading of the ribs in 6 grades and the second grade they had found associated with rickets. Beading of the ribs, however, was a poor sign as regards the cure of rickets, since it persisted in spite of the use of cod-liver oil and the ultra-violet rays.

They had found that in the winter it takes 3½ months to cure rickets by means of cod-liver oil while in the summer, when they had the additional factor of light, it took 2½ months to effect the same results. Beading had little value in an infant over one year as a sign of the development of rickets, for when the Harrison groove appeared the beading disappeared.

The x-ray had been very disappointing; the change in the epiphyses was a late sign of rickets, the beading of the ribs being noticed much earlier. The lowering of the phosphate content of the blood was also a much earlier sign than the changes in the epiphyses. The condition of the development centers was also an unreliable sign as was the calcification of the shaft of the bone. On the other hand, in regard to cure, the situation was quite different. When they gave light therapy or cod-liver oil, within 2 weeks, or certainly within a month there was marked calcification of the epiphyses, so that roentgen ray was the most reliable test to tell whether a therapeutic method was efficacious.

The normal inorganic phosphate according to the method of Dorsy and Tell varies from 4 to 4½ mg. and amounts below 3.75 were considered as indicating the presence of rickets. They found that this change in the phosphate content of the blood came about considerably earlier than changes that could be detected by the x-rays, and sometimes comes sooner than beading. They had found that when they gave whole milk the beading came earlier than the lowering of the phosphate. Whether a low inorganic phosphate content to be judged to be a pathognomonic sign was difficult to say at the present time. It had been noted that in the winter months the inorganic phosphate decreases and in the summer it rose. This "seasonal tide" in the phosphate content seemed not entirely associated with rickets.

As regards the cure, the phosphate content increased very rapidly as the rickets improves. Dr. Hess had seen the phosphate go up from 15 to 20 per cent. in one week.

In addition to cod-liver oil and the ultra-violet light, the carbon arc light had been found very efficacious in the treatment of rickets. The carbon arc light could be used immediately for one hour whereas the ultra-violet light can be employed for only a few minutes at first.

They had had 29 cases on dried milk. Of these 14 showed the rosary as the first sign of developing rickets. Of 16 cases on raw milk, 9 showed the rosary first. A few cases showed only a lowering of the blood phosphate and no other signs.

Of 55 infants on various defective diets, 51 showed rickets. Not all of these were fed on dried milk; some had raw milk and some protein milk.

Schmorl, in the report of his pathologic observations, stated that he found rickets at autopsy in 97 per cent. of the children between the ages of 4 and 18 months. Dr. Hess had studied 25 breast fed infants and found that almost one-half showed x-ray signs of rickets.

Discussion. Dr. E. W. Saunders, of St. Louis, said that as to the greater prevalence of rickets in winter than in summer, the only factor that seemed to be responsible was the sunshine. It would seem that in some way our climate in the Northern Hemisphere afforded the most rational theory as to the etiology of rickets, inasmuch as those fed on dried milk and those fed on fresh milk showed the same kind of a drop in the incidence of rickets in the summer, making it evident that the incidence of rickets could not be attributed to the feeding. There was one symptom of rickets that had not been mentioned and that was the classical symptom of head-sweating. This symptom came first. In the speaker's clinic one question they asked in taking the history of every baby was "Does the baby sweat when asleep?" "How is the child dressed and covered?" "Is the sweating limited to the head only?" As to the other changes there were changes at the costo-cartilage junction before the beading occurred. There was a little appearance at the costo-cartilage junction something like a tape-worm segment which represented obvious exostosis.

Dr. Alfred F. Hess said he thought this seasonal tide was probably due to climate and lack of sunlight during the winter. As regards to diet, a few years ago he had tried to see if he could prevent rickets by employing the same kind of milk in the winter that the children had been getting in the summer. One group of children were fed on dried milk from pasture fed cows and another group received milk from cows receiving winter fodder. The same amount of rickets developed among the children getting the milk from the pasture-fed cows as among those receiving the milk of the stall-fed cows.

PROGNOSIS AND TREATMENT OF TUBERCULOSIS IN INFANCY AND CHILDHOOD.

Dr. Rowland Godfrey Freeman, of New York, stated that it was characteristic of tuberculosis in early life that it might cause considerable temperature with little leucocytosis or increased polynuclear count. There is very little emaciation and the lesion is more likely to be in the lower lobes of the lung than in the apices. The results obtained in the cases related, Dr. Freeman believed, were due to the following curative agents in the order of their comparative value: (1) fresh out-of-door moving air, cold if possible. The value of this agent was generally conceded but too few cases were kept in this sort of air 24 hours each day; (2) heliotherapy. This was a valuable agent in tuberculosis of the lungs in children in this country. In a limited experience Dr. Freeman had seen no bad results from its use. In visiting Rollier's sanitarium at Leysin, Switzerland, last summer, Dr. Freeman learned that they considered it a rather dangerous agent in lung tuberculosis. They used it but thought it should be employed with caution; (3) cod-liver oil. This was a useful agent if it was well tolerated as it was usually; (4) a full diet was essential and complete rest was necessary for a long period.

Tuberculosis in infancy, which was localized, might be cured by prompt interference. If, however, it had involved the lungs, it rapidly became a generalized tuberculosis and gave an absolutely bad prognosis. Tuberculosis in either infancy or early childhood, whether rapidly progressive or slow in its progress, caused comparatively little emaciation. If an infant or young child, with a chronic lung condition, emaciated rapidly, the probability was the condition was not tuberculosis.

THE DOSAGE OF DIPHTHERIA ANTITOXIN; AN ANALYSIS OF THE RECORDS OF THE SOUTH DEPARTMENT.

Dr. Edwin H. Place, of Boston, presented this study. He stated that very extensive experience and experiments had demonstrated that tissue-toxin combinations could not be split by any excess of antitoxin. We had no certain measure for the minimum fatal toxin dose for man. The gradual production of toxin in the disease, probably at a rapidly increasing rate, made it difficult to even form an opinion as to the total toxic production in human tissues. It seemed that the effective dose of antitoxin must be determined chiefly by the results actually obtained in practice rather than a priori facts from animal experiments. The obstacles to determination of such clinical decision were obvious: (1) the time of administration of antitoxin in the disease is far more likely to determine the result than any variation in dosage, or, in fact, any other influence; (2) the age of the patient has a distinct influence on the mortality, the younger the child, the higher the mortality; (3) the method of administration of antitoxin has a marked influence on the effectiveness of any certain dose. In the antitoxin report of the American Pediatric Society, the mortality ranged according to the day antitoxin was given as follows: 1st day, 4.7 per cent.; 2nd day, 7.4 per cent.; 3rd day, 8.8 per cent.; 4th day, 20.7 per cent.; 5th day, 35.3 per cent. The striking influence of antitoxin on the diphtheria mortality was so evident from statistics throughout the world as not to require citing here. In the South Department of the Boston City Hospital, the drop from an average of 40 per cent. to about 15 per cent., in 1895, occurred with a dosage of about 1,500 to 2,000 units. It thus was evident that doses now considered relatively small would effectively control a large percentage of cases and it soon became evident that late in the disease no dose was effective. It was possible that between these 2 groups there might be cases, probably few, in which toxin damage had not become unalterable, although small doses would not save them. Larger doses were used therefore, and a slow decline in the mortality curve was noted. It was to inquire whether this was due to earlier treatment, milder cases or difference in age, or whether due to difference in dosage. Groups of cases at different times were studied. In the first group, 1895-1896, the dose of antitoxin was customarily from 1,500 to 2,000. In this group the mortality was 8.8 per cent. In the second series, 1900-1901, the usual dose was 2,000 to 4,000 units, occasionally 8,000 at intervals of 4, 24 and 72 hours or even several days, until clinical improvement. Dosage as high as 110,000 was occasionally reached subcutaneously. Only 35 per cent. received a single dose. In the third series, the dosage was much higher, varying from 4,000 to 100,000, averaging about 30,000 units, of which 92 per cent. received only 1 dose; 62 per cent. were treated intravenously. Whether the increased dose or the intravenous route played the more important part it was impossible to say, as no group of small intravenous doses was available in this clinic. Nearly all the severe cases for the past 5 years had had intravenous injection but no fall had occurred in their mortality curve; in fact the mortality had increased somewhat so that other factors had been, at least, more important. In their wards the estimate of the amount of toxin to be administered was made on the severity, the extent and especially the rapidity of development of the local inflammation. The general scheme of dosage had been: mild 2,000-5,000; moderate 10,000-30,000; severe 30,000-100,000. No appreciable harm had been found from these larger doses.

In drawing conclusions from these cases, the errors in histories, in possible variations in the severity of the disease, the variations in the actual antitoxin content, as compared with the label, must be borne in mind. These statistics demonstrate again that the time of treatment supersedes all other factors in the mortality. This fact, reiterated again and again, is not acted upon in actual practice as often as it should be. It is not a bad dictum that any inflammation of the mucous membranes, unless proved clinically otherwise, should be treated as diphtheria. In such a plan, antitoxin should be given at once, unless the physician is sure that no harm could result from diphtheria with delay. The fear of anaphylactic shock is much greater than facts justify, and the fear of diphtheria poisoning is tremendously less.

The figures presented tend to show: (1) that doses of 2,000-

4,000 units were inadequate in diphtheria treatment, even if repeated at intervals; (2) that intravenous antitoxin in doses averaging 30,000 may save lives that would be lost with less adequate treatment; (3) that no dosage of antitoxin is likely to reduce the mortality of diphtheria as a whole unless the delay in administration can be eliminated.

Discussion. Dr. E. W. Saunders, of St. Louis, declared that the greatest enemy we had in connection with the problem of diphtheria was the laboratory; in other words, waiting for the verdict of the laboratory. The mortality from diphtheria was still a disgrace. He could not see why a doctor should wait for a laboratory report when he had any suspicion that the case might be one of diphtheria. As far back as 1895, after they had had a great epidemic of diphtheria in St. Louis, Dr. Saunders said he never went to bed without having injected every case that came under his care that he suspected of being diphtheria. At the same time, years afterward, they had country practitioners sending specimens by mail, and waiting for the verdict of the laboratory before injecting antitoxin. One should not wait for a laboratory report when there was any suspicion that a patient had diphtheria.

Dr. L. Emmett Holt, of New York, called attention to one point in Dr. Place's paper which he stated was an obstacle to progress in regard to therapeutics. Dr. Place said he was giving large doses because they had always been giving large doses. If we all followed that plan we would not make much progress. There was great danger in doing things because we always have done them. He did not think Dr. Place would risk the lives of his patients if he gave the doses of diphtheria antitoxin that others had found to be safe in the treatment of diphtheria. Progress in science had always been made by men who hesitated to do the thing they had been taught to do and which everyone else did, and the cases nearly always did better by omitting something that had always been done.

Dr. Place acknowledged that Dr. Holt's point was well taken. Experiment was necessary if we were to find the truth and it was possible that this experiment was one-sided, but it was not always convenient to carry out both sides of an experiment at one time. As to the question of large doses and smaller doses, with them it had been a question whether the smaller doses were not given at a risk to the patient's life.

Dr. William H. Park, of New York, (by invitation) said he had not arrived in time to hear all of Dr. Place's remarks, but if he got the gist of them from the discussion he thought they were getting together on the question as to whether we could lessen a bit on what we had thought to be a safe dose of antitoxin. They had tried giving different doses. They at first gave doses of 1,000 to 2,000 units to a mild case and 4,000 to 8,000 to a more severe one. They had tried from 2,000 to 8,000 units and then up to 16,000, and then they tried giving no antitoxin at all. They decided within 6 weeks that they had had enough of that. It had been surprising in reference to the mortality how little difference there was in the mortality among those receiving the large doses and those receiving smaller doses. Those receiving the larger doses made quicker recoveries, but the large doses did not seem to save more lives. He thought Dr. Place might with safety risk giving smaller doses, though he did not think there was any great harm in giving the larger doses, and in an occasional case the larger dose might do more good. He thought there was no harm in giving repeated doses, but it was rather hard on the Health Department that furnished the antitoxin. Another thing in which they had been interested was that occasionally they had a serum that gave no chills, and when they had enough they sent that serum out. It was possible to obtain a serum for intravenous work that caused no chills. One speaker brought up the question of the harm that the laboratories did. Dr. Park did not think he meant that. It was the laboratory workers and the people like Dr. Place who had urged physicians not to send specimens for report when diphtheria was suspected. He did not think laboratory workers had ever asked physicians to wait for a laboratory diagnosis in a case that seemed to be in danger or in a case that showed any suspicion of diphtheria. We were getting together on the belief that the intravenous injections were better than the subcutaneous and intramuscular; that a single dose was necessary, repeated if one wanted to repeat it; that a large enough dose was necessary, but that one might give more if he wanted to do so.

THE SIZE OF THE SELLA TURCICA IN RELATION TO BODY MEASUREMENTS.

Dr. Lawrence T. Royster and Dr. Nathaniel F. Rodman, of Norfolk, Va., said that as usual when a new field of medical research was recognized there was a rush of "observers" with a resulting sudden flooding of the literature with articles on observation, experimentation and guess. This had been the case with endocrinology, which had hardly progressed beyond the stage of systematized speculation. Such meagre knowledge as was possessed at present hardly justified one in treating his patients with animal gland extracts except in most carefully selected cases under conditions of absolutely safeguarded control. To those who saw many cases which involved the study of nutrition it was apparent that a lack of or overindulgence in food alone did not account for all such cases. This was particularly true of over-fat children. Among the most striking of the physical characteristics attributed to the disturbance of the pituitary (sometimes associated with thyroid dysfunction) might be mentioned certain disproportions between the (torso) height, the half height (extension) and the span in relation to height; other characteristics which were more commonly observed were the deposition of fat in excess in certain localities, such as the upper pelvic girdle, especially over the iliac crests and over the sacrum, in such a way as to form a pad in the sacral triangle.

The present study was undertaken to determine the relation of one-half the height to a definite landmark; to determine the relation of the span to the height; to what extent fat pads in the sacral triangle are present in the average child; by taking x-rays of the sella turcica to determine, if possible, the relation, if any, between the size of the sella turcica as measured on the flat plate and the body measurement of the child and the presence of fat deposits. Four hundred unselected children were measured and x-rays of 350 were taken. The 400 were divided into groups as follows: under 2 years; 2 to 5 years; 5 to 9 years; 9 to 15 years. There were 50 males and 50 females in each group. From the data collected, the following deductions were drawn: (1) a base of comparison of measurements is established; (2) the torso is of much greater length than the lower extremities in young children and the point of one-half height gradually reaches the upper border of the symphysis much earlier than has been supposed; (3) the presence of fat pads in the upper pelvic girdle and over the sacral triangle are normal in infants and young children and are present in the majority of cases during older childhood, but begin to disappear about the seventh year. They are to be considered suggestive of pituitary dysfunction only when pronounced; (4) from infancy to the fifteenth year the average measurements of the sella turcica show steady increase in size, amounting approximately to 50 per cent. but the interclinoid space does not increase in proportion to the other measurements of the sella, but on the other hand remains practically constant; (5) there is no definite relation between the size of the sella and the interclinoid space as measured on the flat plate, and the deposits of fat in the upper pelvic girdle or sacral triangle; (6) there is no definite relation between the size of the sella and the interclinoid space as measured on the flat plate and normal over- or under-weight children; (7) there is no definite relation between the size of the sella or interclinoid space as measured on the flat plate and the point of one-half height or the height to span ratio; (8) the relation of span to height remains practically constant throughout childhood; (9) the size of the sella as measured on the flat plate is probably a very inaccurate guide to the function of the pituitary; (10) in taking a radiograph of the sella distortions a shadow may occur which causes erroneous interpretation, due to the angle of either plane of the skull in relation to the target. These divergences may cause accentuation of the optic foramen, suggesting diverticula and the shadow of the outer angle of the lesser wing of the sphenoid may cause a distorted shadow of the anterior clinoid process. In the group under 2 years of age, the size of the sella in boys was 5.19 by 3.92 cm.; in girls the sellas measured 5.52 by 3.91. The interclinoid space was 3.65 cm. for the boys and 3.06 for the girls. In the group 2 to 5 years of age, the sellas of the boys averaged 7.36 by 5.38, of the girls 7.1 by 5.72; in the boys the interclinoid space measured 5.24, in the girls 4.56. The measurements of the sellas gradually increased as the age advanced, until in a group of 23 children of 13, 14 and 15 years the average dimensions of the sella were 9.6 by 6.82.

Discussion. DR. L. EMMETT HOLT said that Dr. Royster had neglected to say anything in regard to the treatment of these cases.

Dr. Royster said he did not have time to go into the treatment. He had treated these cases largely on the basis of his own experience and some of them were treated after many conferences with Dr. Timme. In these children the food intake was measured in calories. They got the child interested in the matter and had him keep account of the caloric intake and note in what form of food the calories had been taken. They watched him for 2 or 3 weeks and saw how he got along without any restrictions. If they found that he was taking an excessive amount of starch they cut that down and they cut the sugar down to 100 calories and then let him go along for a week and then weighed him to see the result of that change before giving pituitary extract. It was simply a matter of the individual case. In some cases one could start with the pituitary gland extract without a reduction of the caloric food intake. Dr. Royster said he was rather extremely in favor of using small doses of Armour's pituitary gland extract, ¼ grain once a day. He had one girl who was gaining a pound a week, and after being put on the Armour's extract she rapidly lost her voracious appetite and the gain in weight was very much less. He gave ¼ of a grain twice a day and then ¼ grain three times a day. In a great many of these children the voracious appetite was decreased by giving them pituitary gland extract, and when they reached a certain point they did not want the carbohydrates and sugar they did before.

A STUDY OF THE SHADOWS IN THE THORAX OF THE NEWLY BORN.

Dr. L. R. DeBuys and Dr. E. C. Samuels, of New Orleans, presented this preliminary report from the Newly Born Service of the Touro Infirmary. The study was based on a series of 52 newly borns, and included careful physical examinations and accurate measurements of all the cases examined which were consecutive and were not selected. Every baby was radiographed within the first 48 hours after birth, with the exception of a premature which was not radiographed until it weighed 3 pounds 14 ounces. In none of these cases was there a heart murmur and in none was there any clinical evidence of enlarged thymus. In no instance was there the slightest evidence of inconvenience to the patient nor of interference in his normal progress following the making of the radiograph. The types of hearts as determined by the shadows were as follows: globular, 21; adult type, 7; drop, 5; nutmeg, 3; square, 2; round, 1; unusual, 1; unclassified, 10.

The study was summarized as follows: (1) heart shadows vary in shape, size and position; (2) these variations occur with no relation to the size of the infant; (3) the heart shadows may be grouped in several types according to shape; (4) the variations in constant relation between the heart shadow and the shadow of size and position occur in each of these types; (5) there is no the thymus; (6) the shadow of the thymus is not necessarily influenced by the position of the heart; (7) the shadow of the thymus varies in its size and position independent of the heart shadow and with no relation to the size of the infant; (8) the variations in the shadows of the heart and of the thymus can exist without clinical manifestations of disease.

CEREBRO-CEREBELLAR DIPLEGIA—ATONIC TYPE.

Dr. T. C. Hempelmann, of St. Louis, stated that the term "infantile diplegia" usually called forth a vivid picture of spastic paralysis resulting from cerebral agenesis from birth injury. There was, however, another form of diplegia, less common and less well known, but apparently of similar etiology, in which spasticity was conspicuously absent, and the most striking symptoms were flaccidity of the muscles and exaggerated mobility of the joints. That spasticity did not always occur after birth injuries to the brain has been noted by many observers, but no special importance was attached to this circumstance.

Little attention was paid to these variations from the classical spastic palsy until 1913 when L. Pierce Clark, in a comprehensive discussion of the whole subject, attempted a more accurate delineation of the flaccid type of diplegia, with an explanation of its pathology. He proposed the name "infantile cerebro-cerebellar diplegia," (Am. Jour. Dis. Child., June, 1912). According to Clark's description the child was regarded as quite normal until it reaches the age when it should begin to sit up or make attempts at standing. It was then noticed for the first time that not only was the child unable to sit alone, but there was complete inability to hold the head, which lolled forward or backward as though the child was spineless. The motility of the arms and legs was normal, but the child commonly lay on its back with the knees and hips flexed, and the thighs strongly abducted and rotated outwardly. The legs could be easily extended, and remained in this position unless the skin were pricked with a pin or sharp instrument, when they were drawn away from the object quite vigorously. There was no atrophy present, but the whole musculature of the body was found to be greatly relaxed. The most striking symptoms, however, was the enormous mobility of the joints, which permitted of extreme hyperextension and the placing of the limbs in the bizarre positions of a contortionist. The electrical reactions were normal, but the reflexes might be normal, exaggerated, diminished, or, rarely, absent altogether. Ankle clonus was absent and the Babinski might or might not be present. As the child grew older an ataxia of cerebellar type was presented, and there was marked incoördination of all the extremities whenever the child attempted to stand, walk or perform any volitional act, this lack of coordination being due to dysmetria. Speech was acquired very late and was then apt to be slow and monotonous. The mental deficit ranged from simple retardation to marked idiocy. Clark believed that transition types between the flaccid and spastic types occurred, and that occasionally the two forms might be represented in different muscle groups in the same individual. In the absence of pathological material, Clark gave it as his opinion that the disorder was the result of an agenetic defect or injury to the brain at or before the time of birth, and probably involved both cerebellar and cerebral hemispheres, especially the frontal, parietal and temporal lobes.

The writer reported 2 cases with complete autopsy findings in one of them. The most striking thing about the brain in this case was the distinct asymmetry between the two cerebral hemispheres and the 2 lobes of the cerebellum, which corresponded to a similar asymmetry of the cranial bones. The left half of the cerebellum was much thinner and smaller than the right, and the blood vessels on the left were considerably smaller than those of the opposite side. Sections were taken from the cortex of both cerebral hemispheres at five levels, beginning in the anterior 5 cm.

of the frontal lobe and at intervals back to the occipital lobe, as well as from areas deeper in the cerebral substance, including the lateral ventricles and choroid. Sections were also made through the internal capsule, medulla, and the right and left lobes of the cerebellum, including the dentate nuclei. The cord was examined by means of sections taken at 4 different levels. In none of these specimens, however, were degenerative changes or evidences of sclerosis found. The asymmetry then was due to developmental defects, involving both cerebellum and cerebrum.

THE NITROGEN METABOLISM IN SOME CONDITIONS OF CONSTITUTIONAL DIATHESIS.

Dr. Frederic W. Schlutz, of Minneapolis, recalled that he had presented work before the Society at a previous meeting in which he had attempted to establish a series of normals for non-protein nitrogen in children. This work he had followed up by quite an extensive investigation on a large series of cases with the object of showing the nitrogen metabolism in various pathological conditions. This work had covered a large range of conditions such as rheumatism, chorea, and certain constitutional diathesis. The series now included several hundred observations. The method of blood analysis employed was the cystin method of Folin. In all such conditions, as rheumatism and chorea, except those that actually involved the kidney function or were accompanied by marked febrile disorder, the nitrogen metabolism was but slightly higher than normal. Part of the study concerned those phases known as constitutional diathesis. It always seemed that these children were a little different from normal individuals. At least one had reason to suppose that they were different from the way in which they reacted to different methods of feeding. In all 112 cases covering the different phases of the constitutional diathesis were studied, including 35 cases of neuro-arthritis, 17 cases of cyclic vomiting, 39 cases of asthma, and 4 of spasmophilia. The cases were all extreme types of the conditions they represented, so that there was no doubt as to the constitutional diathesis being present. In all these different phases of the constitutional diathesis the one striking feature was the high output of total nitrogen. In all of these cases there was a higher total nitrogen output than in normal children.

The explanations of these findings Dr. Schlutz said he could not give unless it lay in the fact that the cases showed a higher energy metabolism than did individuals not so effected. This theory should be checked up by energy metabolism determinations.

A STUDY OF ACIDOSIS DUE TO KETONE ACIDS.

Dr. James L. Gamble, Dr. S. G. Ross and Dr. F. F. Tisdall, of Baltimore, stated that using as subjects epileptic children who were being fasted as a therapeutic measure, it was undertaken to determine the extent to which the reduction of the plasma bicarbonate during fasting was due; (1) to depletion of the inorganic base of the plasma, and (2) to the concentration of ketone acids developing in the plasma. The total inorganic base in the plasma was determined by measuring separately the concentrations of Na, K, Ca and Mg. It was found that the total inorganic base concentration was during fasting accurately sustained at its usual average value. The reduction of bicarbonate was thus apparently due entirely to the concentration of abnormal organic acids in the plasma. This inference was sustained by direct measurements of the concentration of ketone acids in the plasma. It was also found that small amounts of cane sugar by mouth brought about a restoration of the bicarbonate concentration to its usual size. From these data it was inferred that glucose rather, than bicarbonate, was the logical agent in the treatment of non-diabetic ketosis.

Discussion. Dr. W. McKim Marriott, of St. Louis, stated that Dr. Gamble had given a very clear exhibition of the development and cure of acidosis. This point that it was not necessary to give bicarbonate was of great practical value. It was not only unnecessary to give bicarbonate but was a distinct disadvantage to do so. That has been brought out by experience as well as by theoretical speculation. When we gave bicarbonate the amount of sodium in the blood was increased and the amount of sodium ions and this increase of sodium ions disturbed the balance between the sodium, calcium and magnesium ions. Dr. Gamble has described one type of organic acidosis. There is another type of organic acidosis other than that known as ketosis. This was accompanied by dehydration while there was a considerable excess of fatty acids. In these cases the administration of sodium bicarbonate would temporarily cause a cessation of the symptoms but unless the cause was removed the effect of the bicarbonate would be relatively ineffectual. In such cases, both of this type and those with ketosis, one might employ glucose. He had been rather interested to note that when the plasma bicarbonate comes somewhere near normal and glucose was then given that the organic acids disappeared; they were burned up and for as long as 3 days an alkaline urine would be passed and the blood bicarbonate will remain high from the excess of alkalies that remained after the organic acids have been removed.

SOME OF THE VAGARIES OF THE SYMPTOMATOLOGY OF PYELITIS.

Dr. D. J. Milton Miller, of Atlantic City, asserted that it was universally recognized that great variations in the symptoms were such a constant feature of pyelitis in infancy as to be almost as much of a characteristic of the disease as the pyuria itself. To again call attention to these well known facts would appear to be quite superfluous, were it not that medical men still occasionally failed to recognize this rather common affection; not so much from ignorance, as from failure to make careful examination of the urine in all acute and chronic affections of infancy, whether the diagnosis be self-evident or obscure and difficult. Several cases were therefore reported illustrating how varied the symptomatology of pyelitis might be. Some degree of fever was one of the most constant of the symptoms of pyelitis, and yet the disease might run its whole course without this feature as was seen by the case of a child 5 years of age, whose symptoms were fretfulness, anorexia, vague abdominal pains and dysuria. The general examination was negative, but the urine contained pus, 100 cells per low power field, and the colon bacilli on culture. There was no fever at any time during the 4 week's illness.

In the second case cited, the pyelitis simulated pneumonia, a not uncommon occurrence. In the absence of x-ray examination other diagnosis than that of pneumonia would have been impossible in this patient had not the urine been examined, or the subsequent course revealed the true nature of the attack. There is a not infrequent association of pyelitis with respiratory affections.

Chills are not common in pyelitis, at least, not in the writer's experience or in that of most American writers, although John Thomson lays stress on their occurrence, especially at the onset. In a case which Dr. Miller cited they were frequent and distressing. This case was that of an infant 5 months of age, with colic and indigestion. The infant suddenly became deeply cyanosed, with intense coldness of the feet, hands and skin, and temperature of 104°. The attacks occurred almost daily for a week, were associated with marked collapse and were alarming; fever invariably attended them. It was found that the urine contained a large amount of pus; the leucocytes numbered 25,000.

Abdominal pain was another rare and, when present, misleading symptom of pyelitis. In the case cited pressure on the abdomen to the left and just below the navel caused loud outcries; the abdomen was distended; the leucocytes numbered 28,000; hemoglobin 50 per cent.; the temperature was from 100° to 102° and 103°. Grave abdominal disorder was feared, until examination of the acid urine discovered pus in large quantities. The pain rapidly disappeared on the administration of alkalies and salol in small doses.

Hematuria, Dr. Miller said, was more suggestive of nephritis or tuberculosis than of pyelitis, yet it might occur and obscure the diagnosis for a time.

Occasionally an old pyelitis, apparently cured, was rekindled by some acute infection, confusing the diagnosis. Pyelitis, without pus, the writer has never encountered. Pyelitis, at times, undoubtedly pursued an acute course, recovering completely without recognition and without treatment. Pus in amount sufficient to constitute a pyelitis was sometimes found in the uncentrifuged urine of infants whose only symptom was fever, and in whom disappearance of the pus and cessation of the fever took place without treatment especially directed to the urinary condition. This sometimes happened at the close of the febrile attack, and made clear an otherwise unexplained illness. Routine examination of the urine of early life has led the writer to believe that acute uncomplicated pyelitides, terminating spontaneously, were not uncommon. And that even prolonged attacks might recover of themselves. Some of the cases seen in adult life were believed to have originated in infancy just as the nephritides of pregnancy and later years sometimes dated from a similar attack in childhood.

Discussion. Dr. Walter Lester Carr, of New York, said he wished to add to the clinical picture of pyelitis a report of 2 babies who were referred to him for treatment. One was a girl of 16 months and the other a girl of 6 months. These babies were interesting in their symptomatology. Both were anemic; both rubbed their thighs and examination of their urine showed pus. A culture of the urine in the older baby showed the streptococcus predominating over the colon bacillus in the first cultures and later cultures gave the streptococcus alone. The younger baby's urine culture showed colon bacilli. The children had been treated for their symptom of thigh rubbing and the pyelitis had been overlooked. The fact that these babies rubbed their thighs is interesting in connection with Dr. Rachford's presidential address in which he made no reference to pyelitis as a cause of pseudo-masturbation. These cases also emphasize the importance of having a catheterized specimen of urine examined, as the results of an analysis and culture will give indications for treatment. In infants the treatment is usually one with medicine. In older children, cystoscopy may be advisable.

ACUTE INFECTIONS OF THE URINARY TRACT IN INFANTS AND CHILDREN SUBSIDING WITHOUT THE APPEARANCE OF PUS IN THE URINE.

Dr. Walter R. Ramsey, of St. Paul, stated that the one characteristic symptom of acute infections of the urinary tract in infants and children was the sudden onset with high fever, frequently as high as 105° to 106°. There was often no other symptom and the child did not seem to be "sick" enough to correspond to the degree of fever present. It was generally conceded that the diagnosis must be finally decided by critical microscopical examination of the urine. The generally recognized requirements for the examination of the urine were as follows: a catheterized specimen in the female; a thoroughly cleansed meatus in the male; the urine to be examined immediately. If in an uncentrifugized specimen with a hanging drop low power, colon bacilli in numbers and pus cells to exceed 10 to the field were present, a diagnosis of cystitis was conceded. The writer said his thesis was *that the appearance of pus cells above a point considered normal, was not necessary to* *establish a diagnosis of an acute infection of the urinary tract.* He had pointed out in previous communications that he had frequently found colon bacilli in great numbers in fresh acid urine, accompanied by characteristic symptoms, without the appearance of pus. He had repeatedly noticed that after the acute onset of a colon bacillus infection of the urinary tract, with characteristic fever, that the urine, although acid and containing myriads of colon bacilli, remains free from pus for several days, after which, pus cells begin to appear in increasing numbers. In other cases, the characteristic symptoms and fever subside after a brief period and the colon bacilli gradually disappear without the appearance of pus in the urine. These acute infections with the colon bacilli frequently accompany or follow directly on the heels of some other infection, and recurrences from time to time are not infrequent. Colon bacilli in great numbers are found constantly in the urine over long periods of time in chronic bacteriuria, and often without pus being present. In these cases the urine is practically always alkaline. That colon bacilli are frequently present in small numbers in the urine of healthy children has recently been pointed out by Findley and Browning, and recently confirmed by Helmholz. It is a perfectly recognized fact that mucous membranes generally are subject to infections of every grade of severity. It is rational to assume that the mucous membrane of the urinary tract is no exception to the rule. It is also a recognized fact that very slight affections of the urinary tract are followed by severe general reactions. The writer's contention was that many heretofore obscure fevers in infants and children are produced by infections with the colon bacillus, these infections might be local or perhaps systemic, and that they might be diagnosed by the characteristic general symptoms and by the elimination of an increased number of colon bacilli in the urine. Several illustrative cases of this sort were cited.

Discussion. DR. WALTER LESTER CARR, of New York, stated that if there is a distended intestine in a patient with pyelitis, colonic irrigations would lessen distention, reduce the number of bacilli in the urine and lower temperature. This measure seems to be of practical value and it adds greatly to the comfort of the patient, especially if there is much fever, with or without the irregular urinary symptoms of pyelitis.

ARCHIVES OF PEDIATRICS

JULY, 1922

HAROLD RUCKMAN MIXSELL, A.B., M.D., Editor

COLLABORATORS:

Rowland G. Freeman, M.D.	New York	Oscar M. Schloss, M.D.	Boston
W. P. Northrup, M.D.	New York	Maynard Ladd, M.D.	Boston
Henry D. Chapin, M.D.	New York	Charles Hunter Dunn, M.D.	Boston
Francis Huber, M.D.	New York	Henry I. Bowditch, M.D.	Boston
Henry Koplik, M.D.	New York	Richard M. Smith, M.D.	Boston
Walter Lester Carr, M.D.	New York	L. R. De Buys, M.D.	New Orleans
C. G. Kerley, M.D.	New York	Robert A. Strong, M.D.	New Orleans
L. E. La Fétra, M.D.	New York	John Foote, M.D.	Washington
Royal Storrs Haynes, M.D.	New York	Joseph S. Wall, M.D.	Washington
Herbert B. Wilcox, M.D.	New York	B. K. Rachford, M.D.	Cincinnati
Charles Herrman, M.D.	New York	Henry J. Gerstenberger, M.D.	Cleveland
Wm. Henry Donnelly, M.D.	Brooklyn	Borden S. Veeder, M.D.	St. Louis
Frank H. Richardson, M.D.	Brooklyn	Frederick W. Schlutz, M.D.	Minneapolis
Edwin E. Graham, M.D.	Philadelphia	Julius P. Sedgwick, M.D.	Minneapolis
J. P. Crozer Griffith, M.D.	Philadelphia	William Weston, Jr., M.D.	Columbia, S.C
J. C. Gittings, M.D.	Philadelphia	A. D. Blackader, M.D.	Montreal
A. Graeme Mitchell, M.D.	Philadelphia	Edmund Cautley, M.D.	London
Charles A. Fife, M.D.	Philadelphia	G. A. Sutherland, M.D.	London
H. C. Carpenter, M.D.	Philadelphia	J. D. Rolleston, M.D.	London
I. A. Abt, M.D.	Chicago	J. W. Ballantyne, M.D.	Edinburgh
William P. Lucas, M.D.	San Francisco	James Carmichael, M.D.	Edinburgh
R. Langley Porter, M.D.	San Francisco	G. A. Wright, M.D.	Manchester
E. C. Fleischner, M.D.	San Francisco		

PUBLISHED MONTHLY BY E. B. TREAT & CO., 45 EAST 17TH STREET, NEW YORK.

ORIGINAL COMMUNICATIONS

CLINICAL VALUE OF BASAL METABOLISM IN INFANCY AND CHILDHOOD.*

By Fritz B. Talbot, M.D.

Boston, Mass.

For many years our knowledge of the caloric requirements of infants and children was based upon measurements of the food intake and food loss in the excreta. Later this knowledge was complemented by measurements in the calorimeter of the amount of heat actually produced by the body. It was not until the classical researches of Rubner and Heubner, in 1898, that the measurement of the heat output of infants and children was started on a scientific basis. The first generally accepted rule was that the daily caloric needs of infants was 100 calories per kilogram of body weight during the first few months, gradually diminishing during the first year of life to about 70 calories. This was a decided advance in our knowledge of infant feeding, but as time went on, it was found that these rules did not apply to sick children, and, if adhered to strictly, were of very little if any value clinically at a time when they were most needed. They therefore fell into disrepute in many quarters. The reason for their failure in sick children was made clear by basal metabolism studies.

---

* Annual Packard Lecture, Philadelphia, Pa.

Basal metabolism may be defined as the minimum heat production obtained when a subject is absolutely quiet, with a normal body temperature, and, after the first 2 years of life, in the "postabsorptive state," that is, 12 hours after the last meal. These qualifications are necessary if the metabolism of different individuals is to be compared with one another or with an accepted standard, because, as has been emphasized in earlier publications, only those observations are comparable which are obtained under identical conditions.

The following data has been based, for the most part on the studies of Benedict and Talbot at the Nutrition Laboratory of the Carnegie Institution of Washington from 1912 to 1920[1] and on subsequent studies by the writer at the Massachusetts General Hospital.

Basal metabolism studies in infancy and childhood have been found to be of clinical value in 2 ways; first, in clearing up many of the problems in the physiology of childhood; and second, as an aid in both the diagnosis and treatment of pathologic cases.

In order to obtain a clear picture of what happens in pathologic cases, it is necessary first to consider the utilization of food in a normal infant. This is shown in the following chart.

The basal metabolism line, representing the number of calories used under basal conditions at different months, shows an elevation of about 14 per cent. above the true basal curve due to the "specific dynamic action" of food, and is shown in the lower solid line curve on the chart.

The dotted line, next above, shows the additional calories used as a result of moderate muscular activity; the amount allowed for activity depending upon the character and development of the child. In quiet infants it is about 20 per cent. and in active infants, sometimes as high as 40 per cent.

---

[1] Benedict and Talbot; Publications of Carnegie Institution of Washington, Nos. 201, 233, 302.

Since between 5 and 10 per cent. of the food taken by mouth, (represented by the heavy line curve), is lost in the excreta, this amount may be subtracted from the total food intake to show the number of calories available for energy growth. The available calories are shown by the line of dashes; the space between the dot and dash lines representing the calories which go to form new body tissues.

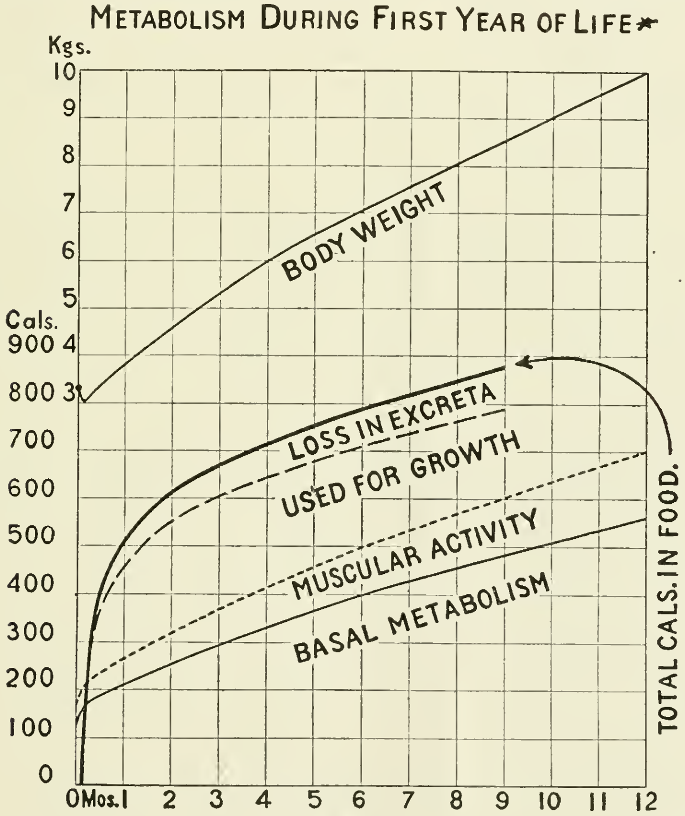


CHART 1.

Many clinicians have noted that infants with malnutrition, requiring 100 calories per kilo or 45 calories per pound, do not thrive even when the food is well digested. An explanation for this has been found in basal metabolism studies of these cases which show that the more an infant is under-weight, the greater are its caloric needs per kilo for growth. If, therefore, additional calories are not allowed in such cases, and no provision is made for the loss due to muscular activity or growth, these infants do not gain. This was first emphasized by Fleming[1] of Glasgow in his studies on the basal metabolism of atrophic infants, and later confirmed by the writer[2]. It has been found, on the other hand, that if the approximate total number of calories are given per day for the age, without considering the body weight, an infant, whether normal or malnourished, will receive a sufficient number of calories for growth.

---

*Talbot: Am. J. Dis. Child., 18: 229, 1919.

Exceptions, however, must be made in infants with very severe malnutrition whose total caloric needs are 200 to 250 calories less than those of the normal infant. Also, in tall, well developed infants, the food requirements are those of the physical rather than the actual age, i. e., a 5 months old infant, who has developed physically to the size of a 7 months old infant, should receive the number of calories consistent with its physical growth and vice versa.

PUBERTY. There has been some question as to whether there is a specific increase in the basal metabolism at puberty. The evidence presented by different observers has been contradictory. In the majority of cases the basal metabolism is normal but in a few instances it is high at puberty. The elevated metabolism is found only in those children with visibly enlarged thyroid glands. The question, therefore, comes up as to whether there is any connection between this elevated metabolism and the "physiological enlargement of the thyroid gland" which is seen most commonly in girls.

Basal metabolism determinations of girls at puberty with visible and palpable thyroids may be definitely elevated, at times to +30 per cent. Such patients may also show some of the milder signs of toxic goitre. Fortunately the symptoms have not been severe and evidence seems to point to the fact that they represent a temporary hyperthyroidism of puberty. It is probably quite unneces-

---

1. Fleming; Quart. Jour. Med., 14:54, 1921
2. Talbot; Am. Jour. Dis. Ch., 22:358, 1921.

sary to adopt the severer therapeutic measures used in toxic adult goitres. Prolonged observation of these cases will show whether they form a group which are particularly susceptible to true exophthalmic goitre in later life.

PREMATURITY. Basal metabolism studies of premature infants show that the total calories in 24 hours are very low. In very small, premature infants they may be as low as 50 calories, (less than 3 ounces of whole milk a day), while in large infants they may be as high as 150 calories. This, of course, does not take into account the extra food necessary for growth and activity. Since premature infants move and cry very little during the day, 15 to 20 per cent. more than the basal needs should more than cover the energy used up in muscular activity. Consequently, if basal figures are doubled, the total caloric needs of premature infants will be supplied leaving a wide margin for growth; this would be between 100 to 300 calories a day depending upon the strength and development of the subject. It should always be borne in mind that besides giving a sufficient number of calories, the food should also be adapted to the infant. Experience has taught that there is no food better than human milk for these babies.

PATHOLOGY. It is in the field of pathology that the basal metabolism is of the most interest to the clinician, first, because it helps explain unknown conditions, and, second, because it often gives data which determines the diagnosis and controls the treatment.

Fever. Du Bois has recently shown in adults that fever increases the energy production according to Van't Hoff's law. Fleming in Glasgow has shown that there is an average increase of 16 per cent. in the heat production in bronchopneumonia in infants. In one of the writer's cases, with a temperature of 104°, and mild convulsions, the energy expended was 100 per cent. higher than when the convulsions ceased and the temperature came down. It is obvious, therefore, that unless more food can be given and digested during fever, there will be a loss of weight due to the necessity of drawing on the body tissues to supply the energy. This, unfortunately, is what often happens due to the fact that during fever the digestion is very often poor and it is necessary to diminish the food intake rather than increase it.

In a study of cases of difficult feeding during infancy, cases are often encountered in which the digestion is good and the baby is apparently receiving enough food, and yet does not gain in weight. If the basal metabolism of such a case is determined, an explanation of the failure to gain in weight is found. This is shown in the following two charts representing cases studied in the Children's Ward at the Massachusetts General Hospital.

The first case shows that the total food intake was scarcely more than the basal metabolism. As there was not enough extra food for muscular activity, the infant had to draw on its body tissues for the extra energy used, with a consequent loss of weight.

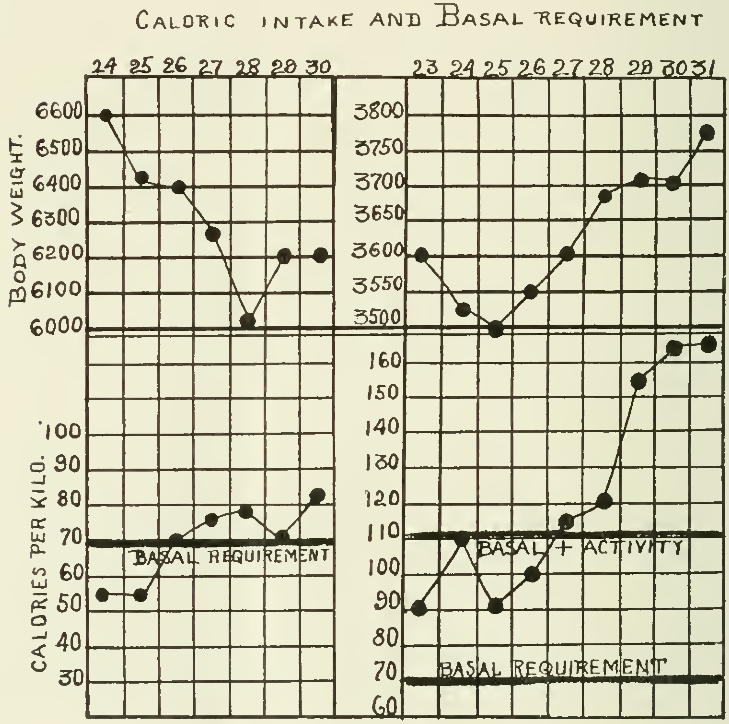


CHART II.

The lower line in the second case represents the basal requirements, the upper line the additional calories used up in muscular activity. When the total food intake was well above the upper line, there was enough food for growth and the weight curve went up.

Diabetes Mellitus. Another instance in which basal metabolism determinations are of clinical value is in cases of diabetes mellitus, where the carbohydrate tolerance is so low that prolonged under-feeding is necessary in order to prevent acidosis. Since basal metabolism determinations give values slightly less than the minimum number of calories consistent with continued life, they mark the danger line below which the food intake cannot go for more than a short period of time without using up the body tissues to such an extent that inanition and death follow. An example of the relation of the food intake to the basal metabolism is shown in the following cases, studied with Dr. F. Gorham Brigham.

CASE 1. E.W., age 7 years, weight 14.2 kilos, should weigh 21.8 kilos. Her basal metabolism was 570 calories. During that week she had received 152 calories in her food and had lost weight. This may be taken to mean that she was very close to the danger line below which her food could not go without risk of inanition and death.

CASE 2. A. T. illustrates the fact that ordinary standards cannot be applied to diabetes. At 11 years of age he weighed 19.2 kilos, and should have weighed 31.4 kilos. Had he been well his basal metabolism for the age would have been 1135 calories, but it actually measured 914 calories. He was receiving 1161 calories a day and holding his weight. If applied to normal standards he would have seemed to be receiving too little food, but it proved, that, like other cases of malnutrition, his total food needs were much below the normal. He proved to have received about 250 calories above his measured basal needs which gave him enough leeway for muscular activity.

The first case, without any leeway for muscular activity, was in danger of entering the stage of inanition, while the second case had enough leeway to be on the safe side. The subsequent history showed that these conclusions were justifiable because the first case died and the second case is holding his weight and apparently doing well otherwise.

Hypo- and Hyperthyroidism. Basal metabolism determinations are of the greatest value in cases of hypo- and hyperthyroidism. As early as 1895 Magnus-Levy recognized the fact that in exophthalmic goitre the metabolism was increased and in cretinism and myxedema it was decreased. The importance of metabolism studies in these conditions was first brought into prominence in this country by Means and Aub in 1919, and basal metabolism studies have since been used as a means of measuring the degree of hypo- or hyperthyroidism in a given case. Hyperthyroidism is much less common in childhood than hypothyroidism and as most of the studies have been made on adults, there is very little available data during infancy and childhood.

The following case of hypothyroidism is an example of the clinical value of basal metabolism as an aid in diagnosis and treatment.

F. S., female, age 3 years, 3 months. Family history and past history were uneventful. At 2 years of age there was evidence of mental retardation and she was unable to sit up straight or walk well. She entered the Skin Department of the Massachusetts General Hospital on June 20, 1920, age 3 years, 3 months, for a peculiar skin eruption.[1] She could not talk and did not want to play. She was short, fat, chunky, with pudgy hands and fingers, and coarse, dry hair. Three-quarters of a grain of thyroid extract was given a day, with marked improvement.

The thyroid extract was omitted about 3 weeks before the metabolism was determined, and then commenced again as shown in the following figure.

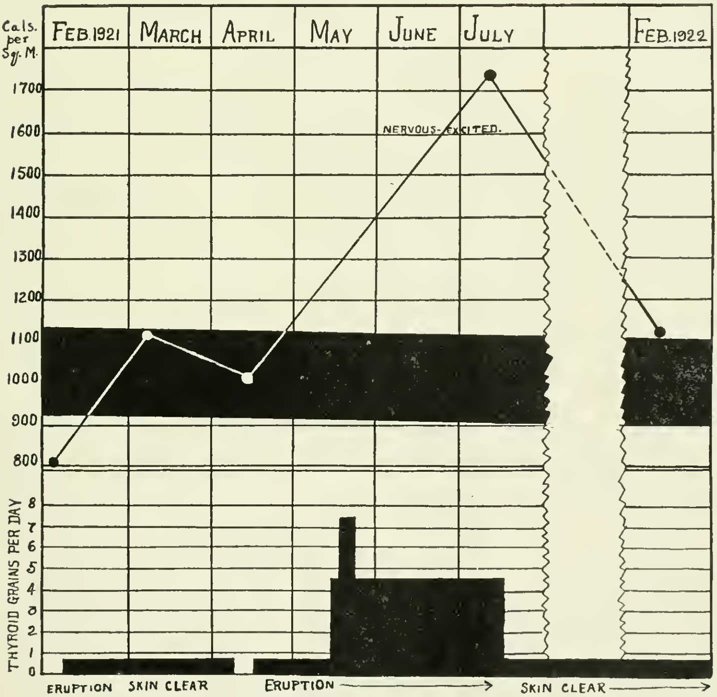
Her initial metabolism was 20 per cent. below normal. This was brought up to normal with ¾ grain of thyroid extract a day. There was a remarkable improvement mentally and the eruption disappeared from the skin.

In April, 1921, the thyroid therapy was omitted without our knowledge and she relapsed so quickly that the parents immediately brought her to the hospital where treatment was resumed. Here the dose was increased tremendously, against my advice, and the skin eruption became more and more pronounced. The child became nervous and excitable, and her metabolism obtained on July 10, 1921, showed a number III activity, and was 73 per cent.[2] higher than the normal. The thyroid extract was then reduced to ¾ of a grain a day; the nervousness disappeared, the skin cleared up, and there was continuous mental and physical improvement. The child now walks, talks, and plays, and the mentality, although still below par, has improved beyond comparison. The trained nurse who first saw the child said she had "changed from an idiot to a bright child." The most important fact shown by this case is the accuracy with which the dosage of thyroid can be controlled by the basal metabolism.

---

[1] The skin manifestations of this case have been reported by Towle and Oliver; Arch. Dermatology and Syphilology, 1922, 5, 88.

[2] Less than 40 per cent. of the +73 per cent. metabolism can be explained by the III activity. There is little question but that the metabolism was markedly increased.



HYPOTHYROIDISM

EFFECT OF THYROID EXTRACT ON THE BASAL METABOLISM

CHART III.

Cretinism. If cretinism is recognized early, that is, toward the end of the first year of life, and treatment instituted and persisted in, remarkable results are often obtained. The longer the treatment is postponed the greater is the permanent damage and the stage is eventually reached when the cretinoid condition becomes fixed and cannot be influenced. Before the introduction of thyroid therapy such cases were considered hopeless. Intellectually the progress is much slower under treatment than the physical progress. Some authorities believe that no case is ever completely cured. This may be due to the fact that during the period of most rapid growth, that is, during the first year of life, the brain does not develop normally without thyroid secretion. If this is true and treatment is started in the first 3 months of life, normal physical and mental development might result. The difficulty lies in making an early diagnosis. Since this cannot be made clinically, it is necessary to turn to basal metabolism determinations. We have been able to make a positive diagnosis of cretinism, by this means, at 3 months of age.

Mongolianism. Basal metabolism studies of mongolian idiots give data which is consistent with clinical experience. In some instances the basal metabolism is low and confirms the clinical observations that in certain cases of mongolian idiocy thyroid extract is of real therapeutic value. Basal metabolism determinations are necessary in these cases to help differentiate those in which thyroid therapy is indicated.

The same is true of backward children who do not show any signs of physical deficiency. One such case has come under my observation and was found to have a low metabolism. She is now under treatment with thyroid and the parents report definite improvement. Future investigations of these cases will determine the applicability of basal metabolism studies to the feeble minded and offers a field of investigation full of great interest, if not promise, for these otherwise hopeless cases.

The problem is more complicated in the study of polyglandular diseases where there is evidence that both the thyroid and pituitary glands are abnormal. At the present time there is no positive evidence that the pituitary gland effects the metabolism, and one must conclude that a lowered metabolism in these cases means deficiency of the thyroid. Future studies ought to go a long way toward clearing up this point.

Hyperthyroidism. Hyperthyroidism is much less common in childhood than hypothyroidism and up to the present time there has been very little available data on this condition. It evidently differs but little from hyperthyroidism in the adult except that in childhood one is dealing with a constantly growing organism, whereas, in adult life, the question of growth does not have to be considered.

The following case of Dr. C. A. Porter's, which is now under observation, is an example of typical hyperthyroidism in a boy 6½ years old. His past history was not unusual. He had had pertussis at 2 years, was subject to bronchitis, and had adenoids removed in June 1920. A physician was consulted because of an enlarged thyroid which the mother had noticed after the whooping-cough. He had always been nervous and was becoming more so. There was found to be a definite enlargement of both the lobes and the isthmus of the thyroid gland. The examination was, otherwise, negative. A diagnosis of exophthalmic tachycardia was made.

On March 30, 1920, x-ray treatment was commenced. In October 1920, after having received 8 x-ray treatments in the interim, his pulse rate dropped from 135 to 86, there was a gain in weight from 42 to 49 pounds, and he showed generally a decided improvement.

On November 21, 1921, his basal metabolism was determined and found to be +34 per cent. He continued to do very well, without x-ray treatment, until March 1922, when it was found that his pulse, while asleep, was 80. He had been growing very tall. He was given his ninth treatment in April 1922 and 2 weeks later his basal metabolism was found to be +26 per cent. Although this slight fall in the metabolism is of no great significance, this information, with future determinations, will show the effect of treatment and give an indication as to when to discontinue x-ray therapy.

With the decrease in the metabolism, the question arises as to how far the destruction by x-ray of the thyroid and thymus glands may be carried on with safety. It is generally admitted that destruction continues for weeks and sometimes months after x-ray exposure has been discontinued, and, therefore, treatment must be stopped with the metabolism still above the normal in order not to induce hypothyroidism. This can only be found out from basal metabolism studies, which are the most satisfactory guide to treatment and should be made at sufficiently short intervals to show how much thyroid secretion persists.

Basal metabolism is also a means of differentiating between toxic and non-toxic goitres; the former showing an elevated metabolism, the latter, a normal metabolism.

The 2 following cases of non-toxic goitres may be contrasted with the foregoing cases as examples in which x-ray treatment was contraindicated. One, a girl of 10 years of age, with a strikingly enlarged thyroid gland but without any symptoms of hyperthyroidism; the other, a girl of 7 years of age with evidence of thyroid gland on both sides of neck, but less striking than previous case. The basal metabolism in both these cases was normal, and x-ray exposure contraindicated.

With the increasing and more wide-spread interest and dependence upon basal metabolism determinations as a means of diagnosis and measurement of treatment, it is necessary to sound a note of warning against drawing too hasty conclusions or the misinterpretation of results. One of the primary purposes of this lecture has been to demonstrate the great difficulties met with in the interpretation of basal metabolism figures. This difficulty of interpretation is far greater in childhood than in adult life because of the complication of the ever-changing standards due to growth. It is well, therefore, to look with skepticism upon any sweeping conclusions drawn from basal metabolism findings until enough data has been accumulated to show the various pit-falls into which one may fall. In spite of the fact that only relatively few metabolic studies have been made on pathologic material, it is evident that such determinations promise to be valuable additions to the other special methods of diagnosis.

CHOREA (Archivos Latino-Amer. de Pediatría, Buenos Aires, Nov.-Dec., 1921). Aráoz Alfaro argues that the facts observed in epidemic encephalitis have demonstrated that ordinary chorea in the majority of cases is a mild encephalitis, localized mainly in the striate body, and due to various infectious agents acting on an unstable nervous system, constitutionally or temporarily substandard. The infectious agent most commonly involved is the one that is responsible for acute articular rheumatism. Other infectious and toxic agents are also liable to induce it in the predisposed, and intense emotional stress may be the occasional cause. —*Journal A. M. A.*

A COMPARATIVE STUDY OF SEVERAL TESTS FOR THE QUANTITATIVE DETERMINATION OF THE REDUCING SUBSTANCE IN CEREBROSPINAL FLUID.*

By Robert A. Strong, M.D.

Clinical Professor of Pediatrics, School of Medicine, Tulane University of Louisiana.

While a divergence of opinion exists as to just what the reducing agent in the cerebrospinal fluid is, the greater part of the experimental data, so far as I have been able to find, seems to indicate that it is a fermentable dextro-rotary monosaccharid, that is, presumably, glucose. All normal fluid contains it, and any reduction in the quantity of this substance indicates that a pathologic condition exists in the meninges.

A qualitative determination with Fehling's solution, therefore, is of value only in so far as it reveals the presence or absence of this substance. It does not demonstrate a decrease, the knowledge of which is of much diagnostic assistance.

A quantitative determination, then, is not only desirable, but is quite necessary in any condition that requires a complete study of the cerebrospinal fluid. Several methods have been suggested and this brief study was undertaken for the purpose of comparing some of these methods with the idea of selecting one to be used as a routine. The fluids for examination were obtained at autopsy, and in cases demanding spinal puncture for diagnostic purposes and were, for most part, from adults.

The tests selected for comparison were: 1. The Lewis & Benedict Method, originally described for blood sugar; 2. The Epstein Miscrochemical Method; 3. The Methylene Blue Method, as suggested by Kasahara and Hattori.

THE LEWIS AND BENEDICT METHOD.

Technic. Two c.c. of cerebrospinal fluid is put into a 25 c.c. volumetric flask containing 5 c.c. of distilled water. Fifteen c.c.

---

* From the Department of Pediatrics, School of Medicine, Tulane University of Louisiana.

of saturated picric acid solution is added, water filled up to 25 c.c. and the whole solution is shaken and filtered (a few drops of alcohol or ether may be used at this stage to break up any foam if necessary). Eight c.c. of the filtrate in duplicate is put into large Jena test tubes for determination; 2 c.c. of a saturated picric acid solution and 1 c.c. of a 10 per cent. solution of sodium carbonate are added; the contents of the tube is evaporated over the flame until precipitation occurs, 3 c.c. of water is added and the tube heated again to the boiling point in order to dissolve the precipitate; the contents of the tube is now transferred to a 10 c.c. volumetric flask, cooled, filled up to the mark with water, shaken and filtered through cotton into a colorimetric flask; the color is compared in a Dubosque colorimeter, either with a dextrose standard, freshly made up every time, or with a permanent standard consisting of 0.064 mg picramic acid and 0.1 gm sodium carbonate in 1000 c.c. and the results are calculated. If desired, 1 c. c. of fluid may be used instead of 2, by making the initial dilution 12.5 c.c. instead of 25 c.c. In this case the test tube graduated at 12.5 and 25 c.c. is convenient. When 1 c.c. of fluid is employed, there is not sufficient filtrate for duplicates.

THE EPSTEIN METHOD.

Technic. The procedure is as follows: 0.2 c.c. of cerebrospinal fluid is drawn up with the pipette of the apparatus (Epstein micro-saccharimeter), or any other graduated pipette into the large graduated test tube. Distilled water is then drawn up into the pipette and discharged into the graduated test tube, until the fluid reaches the 1.0 c.c. mark; picric acid is added to the 2.5 c.c. mark, and the tube shaken vigorously; the contents are filtered through a small filter, or centrifuged for 2 to 3 minutes; 1 c.c. of the filtrate is now withdrawn, put into the boiling tube and heated carefully over the naked flame. The contents of the tube is boiled until all but 2 or 3 drops of the solution is evaporated. Five-tenths c.c. of a 10 per cent. soda solution is now added and the tube heated again until the contents are down to a few drops, the color of the fluid being changed from yellow to deep red or reddish brown. Three or four drops of distilled water are added and the tube warmed gently. The contents are next transferred to graduated tube 1. The boiling tube is rinsed several times with a few drops of water, the tube being warmed with each rinsing. The volume of the fluid is then made up to mark 50 on the scale. The color of the resulting solution is now compared with 1 of the 2 standard tubes A. or B. If the fluid tested is darker than the standard A, which represents 0.05 per cent. of sugar, and is lighter than the standard B, which represents 0.1 per cent. of sugar, the first standard is used for comparison. The solution in the graduated tube is gradually diluted with water until the color matches. The percentage of sugar on using standard A is figured out, each reading on scale being 1/1000. For example, if the reading is 86, then (86/1000) 0.086 per cent. If B. is used, the figure on the scale is multiplied by 2, divided by 1000. For example, if the reading is 73, then 73 × 2/1000 equals 0.146.

THE KASAHARA AND HATTORI METHYLENE BLUE METHOD.

This depends on the fact that when the glucose solution is heated with the methylene blue solution in the presence of an alkali, a definite reaction takes place, and the depth of the color is directly proportional to the quantity of glucose present.

Technic. After numerous experiments, it was found that the quantitative determination of the glucose in the spinal fluid by means of the methylene blue solution is best performed in the following way: To 1.0 c.c. of 0.004 per cent. methylene blue solution are added 3 drops of 10 per cent. potassium hydroxid solution. Adding the spinal fluid to be tested from a buret, determine the minimal volume of it, with which this mixture becomes perfectly colorless by boiling. When the minimal volume (c.c.) is determined, the amount of the glucose present is calculated from the formula; $\frac{0.01}{n} = p$, where p is the percentage of glucose in a cerebrospinal fluid, and n is the number of c.c. of cerebrospinal fluid used. If, for example, the minimal volume of the spinal fluid used is 0.5 c.c., we find the amount of the glucose present as follows: $\frac{0.07}{0.5} = 0.02$ per cent.

I have checked this method with known glucose solutions and have found it sufficiently accurate for practical purposes. I have found it convenient to use a small volumetric pipette instead of the buret suggested in the original technic.

SPECIMEN No.	SOURCE OF FLUID	PER CENT. GLUCOSE			REMARKS
		LEWIS-BENEDICT	EPSTEIN	KASAHARA HATTORI METHYLENE BLUE	
1.	Adult at autopsy. Pulmonary T. B.	0.075	0.079	0.064	Fluid clear, each test run twice.
2.	Child, intestinal intoxication, convulsions, meningism.	0.127	0.130	0.110	Fluid clear, pressure moderately increased, sterile. Urine negative for sugar.
3.	Adult, syphilis.	0.064	*	0.059	Positive Wassermann.
4.	Adult, syphilis suspected.	*	0.048	0.040	Negative Wassermann.
5.	Adult, syphilis suspect.	0.118	*	0.112	Negative Wassermann.
6.	Pooled fluid from 3 adults, syphilis suspected.	0.074	0.070	0.068	Negative Wassermann in 2, positive in 1.
7.	Child, intestinal intoxication, convulsions, meningism.	0.114	0.124	0.113	Fluid clear, pressure markedly increased, sterile. Nine negative for sugar.

---

* Not sufficient to make all tests.

The table of results is interesting in several instances. First, the sugar content of the fluid in specimens No. 2 and 7 was high. In both instances the fluid was from a child with convulsions during an intestinal intoxication; I fortunately had a record of the urine in both of these cases but unfortunately did not determine the blood sugar. This would have been of special interest. Levinson has found that the sugar content in the cerebrospinal fluid and the blood were about the same in diabetic cases. The blood sugar would probably have been high in these instances. The high sugar content of the fluid in cases of this type was also noted by Schloss and Schroeder in their study of normal and pathologic fluid.

The higher percentage with the Epstein micro-saccharimeter as compared to the Dubosque colorimeter is entirely in accord with Levinson's check of the 2 methods with a standard solution of dextrose. The trifle lower percentages with the Kasahara-Hattori methylene blue method are about in accord with the check that I made with known solutions of glucose but are not sufficiently inaccurate as compared to the more complicated Lewis-Benedict test as to be of any consequence. The personal equation enters here as in all determinations of this sort which are so complicated with many sources of slight error and I am willing to accept responsibility, pending further study of this more recent method.

As far as this study has progressed I feel justified in concluding as follows:

1. The Lewis-Benedict test, while generally accepted as being the most accurate test, requires a Dubosque colorimeter.

2. For ordinary use, the Epstein method is quite as useful. The expense of an Epstein micro-saccharimeter is about one-tenth that of a Dubosque colorimeter. The operation of the Epstein apparatus is much more simple.

2. The methylene blue method is rapid, convenient and sufficiently accurate for practical use and is recommended for the less elaborately equipped laboratory.

Pass Christian, Mississippi.

BIBLIOGRAPHY

1. Kasahara and Hattori: Am. J. Dis. Child. 22:2 (Aug.) 1921.
2. Levinson, A.: Cerebrospinal Fluid in Health and Disease, St. Louis, C. V. Mosby Co., 1919, p. 128.
3. Schloss & Schroeder: Am. J. Dis. Child. 11:1 (Jan.) 1916.
4. Levinson, A. Ibid, p. 160.

EXPERIMENTAL STUDY OF WASSERMANN REACTION IN CHILDREN (Policlinico, Rome, Feb. 6, 1922). De Villa and Ronch report extensive research at the children's clinic in Rome in charge of Luzzatti. Sixteen tables show the findings with various lipoids, human milk, serum, etc., used as amboceptor or antigen. It was apparently established that cholesterin or a mixture of lipoids can be used for the antigen in the Wassermann reaction. Human milk can also serve as a partial antigen, and human serum as a partial amboceptor. The serum from the colostrum of women, syphilitic or not, can substitute completely the syphilitic amboceptor, but can never serve as an antigen. The proportion of cholesterin in the blood has no influence on the Wassermann reaction. The final conclusion is that the antigens function by their lipoid content, and that the amboceptors of syphilitic serums are of albuminoid proteic nature.—*Journal A. M. A.*

A CLINICAL REPORT OF SIMPLE METHODS IN THE CARE OF PREMATURE BABIES.*

By Walter Lester Carr, M.D.

New York.

This brief report of premature and incubator babies is based on observations made at the Manhattan Maternity and Dispensary where there were 1435 confinements during 1920 and where the incubator described below is in use. A few babies were seen at the Woman's Hospital where there were 873 confinements in 1920 and in the maternity service of the City Hospital with 120 confinements for the same period. In the 2 latter institutions this incubator is not used and the babies were observed merely for variations in temperature, methods of feeding and general development.

The incubator room at the Manhattan Maternity is 6½ feet by 7 feet with a ceiling 12 feet high and it has a single door opening from the main nursery. The air intake is from a window by means of a flue, 9 by 2 inches, and the air is carried back of a radiator. The room temperature is kept at 80°.

The incubator is an aluminum tray, 24 inches in length and 12 inches in width, with a hood 12 inches high that does not extend the whole length of the tray but allows a baby's head to be partially outside of the hood. Over this open end there is a curtain to protect a baby's head and body. The other end of the incubator is closed but has in it a door 4 by 6 inches. In the top of the incubator are 3 openings for electric lights that are placed on elbows so as not to interfere with the clothing. One 15 Watt light will give an incubator a temperature of 76°; 2, a temperature of 88°; and 3, a temperature of 96° in three-quarters of an hour.

The advantage of 3 lights in the incubator is appreciated if a baby has many variations in body temperature as the heat can be raised or lowered according to the requirements, for a moderate heat is found to be better than a constant high temperature. A thermometer is placed inside the incubator in a position to be observed by the nurse. The temperature of the incubator is maintained about 90° if a baby's heat is below 95°. As a baby's temperature goes to normal, the heat in the incubator is reduced. The incubator is light in weight and has the advantage of portability and cleanliness. New incubators are to be made with a movable top so as to lessen the handling of babies.

---

* Read before the Thirty-third Annual Meeting of the American Pediatric Society, held at Swampscott, Mass., June 2, 3, and 4, 1921.

At the time of birth, delicate, subnormal babies are anointed with sterile oil, but not bathed, the eyes are treated, an umbilical dressing is applied, premature jackets with caps and diapers of cheese cloth and cotton are used. Temperatures are recorded carefully. It has not been found practical to weigh babies in incubators but the nurses exercise great caution in the details of handling and weighing when babies are removed from the incubators. A light mattress and blanket form a bed that is readily sterilized.

The following general rules are furnished to house physicians and nurses so that they may understand the requirements of weak and premature infants:- "The more premature a baby the more feeble the digestion. Metabolic processes are slower than in a full-term infant and loss of heat is relatively greater. Tolerance for sugar is greater than for fats and proteids, as these babies have less fat tissue than babies born at term. Breast milk should be given if it can be obtained; it should be drawn from the mother or wet nurse, diluted with equal parts of 5 per cent. milk sugar solution and fed with a medicine dropper or a Breck feeder. The lower the body temperature the more essential it is that sugar should be added to the milk but the dilution may be diminished as the baby grows stronger. Premature babies do not bear a high fat and this may give trouble even with mother's milk. If cow's milk has to be given, it should be boiled and diluted as ordered. Water must be given freely. Feeding intervals should be about 2 hours apart and the quantity should not exceed 1 to 2 drams at each feeding for the first few days but the feedings must be watched and the amount gradually increased. Whenever possible, feeding should be done without removing a baby from the incubator so as to avoid handling."

The feeding of premature infants is one of the most difficult problems in their management. Not only is there difficulty in giving the food in the right proportions and amounts but there must be recognition of the weak musculature that keeps a baby from nursing or holding the nipple of a bottle. Feeding should be by means of a medicine dropper, a Breck feeder or a tube, size

12 or 14 French, and a nurse must exercise constant vigilance so as not to prolong feeding to the point of fatigue, as premature babies are easily exhausted. Although these babies require a careful food adjustment, their need for the first days after birth is for fluid and this may be supplied in part by sterile water or by a 5 or 6 per cent. milk sugar solution. Success in management comes largely by reason of a nurse's care and of her understanding of the symptoms of low vitality rather than by forcing of a large amount of food.

Dextri-maltose in a 5 per cent. solution is fed to babies of low vitality who do not gain with lactose. The malt sugar is, however, more often useful in a milk modification than as a sugar solution.

Cane sugar is given to babies who have a persistent low temperature and it apparently helps heat production. Occasional doses of brandy and whiskey are administered to very weak babies.

Lavage and gavage are helpful for babies who take their food slowly and for those who regurgitate. We have observed that gavage gives an increase in weight and prevents fatigue. After 2 or 3 days a more simple method of feeding should be resumed. Lavage will lessen and perhaps prevent regurgitation by increasing stomach motility. Neither of these methods should be persisted in because they require handling and add the risk of damage to the mucous membrane with subsequent infection.

Hypodermoclysis of a sterile solution of normal salt, or a 5 per cent. glucose solution, thoroughly sterilized and filtered, may be administered up to 50-75 c.c. In my experience it is injurious to overload the tissues in small, premature infants and an amount as limited as 25-30 c.c may be sufficient to restore circulation and vitality.

Whatever the methods of feeding, it is essential to realize that the caloric requirements are high. Cook, in a recent article (ARCHIVES OF PEDIATRICS, April 1921) fixes 160 calories per kilogram of body weight as necessary. La Fétra (ARCHIVES OF PEDIATRICS, January 1917) regards 120 calories as the least on which a premature baby will gain. Our experience agrees with these observers and we are feeding higher calories, particularly the sugars, than were formerly recommended.

The intraperitoneal route for the introduction of fluid is beneficial for a limited number of patients.

The administration of fluid via the superior longitudinal sinus is not a safe means of combating loss of weight as the sinus is small and friable and other methods are more satisfactory and less dangerous in babies under 4 pounds.

A normal saline solution in colonic irrigations with retention of fluid has been one means of combating weakness. In the use of saline and glucose solutions by rectum, care should be taken to keep the fluid above blood heat and exposure of a baby as limited as possible.

Thirty premature babies were observed at the Manhattan Maternity during the year 1920, less than half of one per cent. (.47) of the number of confinements, and this proportion seems to be the same at the other institutions mentioned.

The average birth weight of the 30 babies was 4 pounds 3/4 ounces. The largest baby, one who was jaundiced, weighed 5 pounds 10 1/2 ounces, and there was some question as to its prematurity. The smallest baby was 2 pounds 11 1/2 ounces; this baby died on the fourth day. The 25 babies who left the hospital had an average weight of 4 pounds 3 ounces at birth and their average weight, when they were discharged, was 4 pounds 8 3/4 ounces.

The chart shows the average weight and average temperature of 25 babies for the first 10 days they were in the hospital. Our routine is to keep incubator babies in the hospital until their weight approximates 5 pounds but this is not always possible. Seventeen babies were over 4 pounds and 8 ounces on discharge. As the temperatures approach normal, the babies are taken from the incubators and kept in the nursery but are replaced in the incubator part of the day. The average time that these incubator babies were kept in the hospital was 36.8 days. Two babies were in the hospital for 87 and 85 days respectively. Two babies were taken by their mothers after 8 days; one baby, who was taken out of the incubator when 10 days old, had a birth weight of 4 pounds and, when just below a year of age, weighed 18 1/2 pounds. This baby was nursed by the mother for 7 months.

The latest report on the babies examined by Dr. Bret Ratner, assistant pediatrician, and by the social service nurses, gives the following results: 8 are recorded as having died after leaving the hospital. Three died early but no history could be secured.

One of the 3 was breast fed; one was fed on the breast and bottle and there is no record of the third. Of the other 5 deaths, one died at 2 months; one at 3 months; one at 4 months; one at 5 months; and one at 13 months. The 2 last were breast fed and both died from pneumonia. Four babies were marked as in good condition on last examination. These babies were partially nursed. One baby, who was being nursed 5 months after birth,

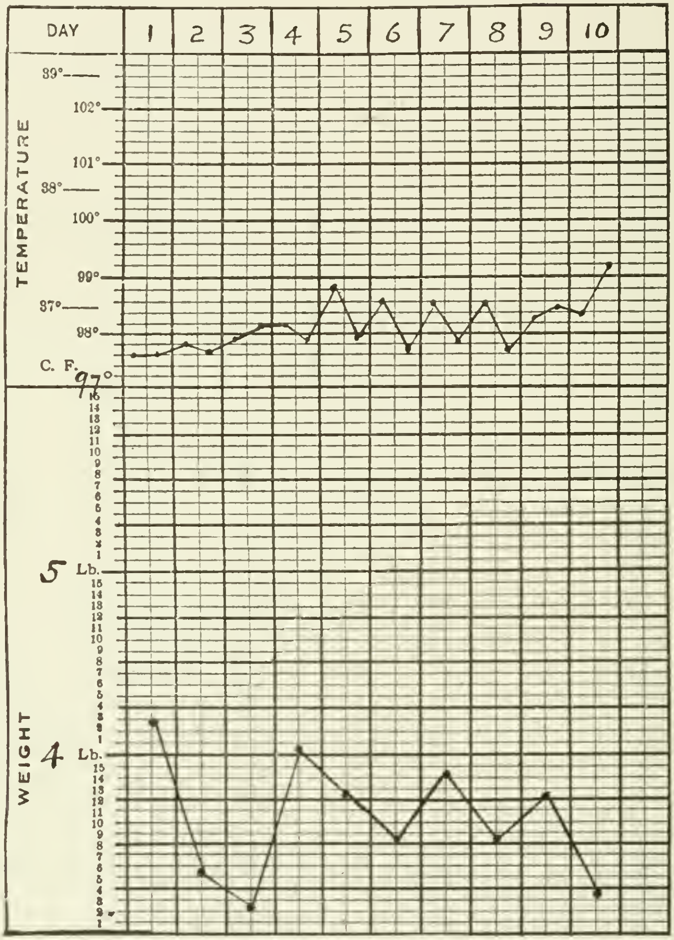


Chart showing average weight and temperature of 25 incubator babies for the first 10 days. The gain in weight is made after this time.

was noted as having a weight of 12 pounds, 7 ounces against a birth weight of 4 pounds, 14 ounces. The nurse states, "apparently a perfect specimen; mother and baby going to the country."

Premature babies are prone to be rachitic and in view of recent methods of feeding powdered milk it is interesting to mention that 5 babies are noted as rachitic and 3 of the 5 were given a well known powdered milk preparation. One of these has rachitis and double keratitis and 2 have "marked rickets."

Nine babies could not be traced and no record can be made of their progress after leaving the hospital.

Fifteen babies were male and 15 were female. There were negro twin girls, one of whom died soon after leaving the hospital. One of twin boys, sent to the hospital from outside, was cared for in the incubator.

The Wassermann reports are not complete but there was not a positive reaction in any of the mothers whose histories are recorded.

The problems of premature babies depends, as has been stated, upon details of care and nursing. District nursing and social service workers may be able to keep these babies alive after they leave the hospital by suggestions for breast feeding and milk modifications but they should at all times work under the supervision of a pediatrician attached to the hospital and who has access to its records.

68 West 51st Street.

JAUNDICE IN THE NEW-BORN (Revue Franç. de Gynécologie et d'Obstet., Paris, Dec., 1921). Deluca's discovery of laceration of the dura mater or meningeal hemorrhage in 36 per cent. of 554 infant cadavers has already been summarized in these columns, March 11, 1922, p. 766. The disintegration of the extravasated blood explains the jaundice. In five cases reported, this cause for the icterus neonatorum was beyond question. The jaundice in such cases is merely a sign, a symptom of the meningeal hemorrhage. The latter is more likely to occur with protracted labor, instrumental delivery and in cases of syphilis.—*Journal A. M. A.*

DETAILS IN INFANT FEEDING.*

By James M. Moser, M.D.,
Associate Professor of Pediatrics, Georgetown University,
Washington, D. C.

In no type of cases is neglect of attention to details more provocative of the habit of changing physicians than in the difficult feeding cases of infants. Time and again we see these emaciated youngsters carried from one doctor to another, the last man getting results with practically the same formula as given by the first because he took the time to explain some little seemingly unimportant fact about the preparation or giving of the formula which the first had overlooked. It has recently been well said that, "infant feeding can never be an exact science but always an experiment." And is it not recognized that the success of any experiment depends upon the closest scrutiny of its smallest details?

At the risk of tiring you with seeming trivialities, it is my purpose in this paper to briefly discuss some of the minutiae of infant feeding omitted from the text-books and by means of case reports show how success in certain instances has "hung upon the turn of a hair."

In the prevention of feeding difficulties, there are 2 important steps which should be taken. First, household books on feeding the infant should be omitted in the nursery. I wonder if the illustrious writers of these books realize how much damage their chapters on infant feeding have wrought? If the advice therein were followed only in normal cases by the mother there would seldom be cause for complaint, for we all know the wide and remarkable tolerance of the average baby for foods; but when the mother of a difficult case undertakes to feed her offspring the formulas therein given (and she will undertake it sooner or later), the results are disastrous. Is it not time we ceased feeding babies by any set "percentage" or "caloric" method, hatched out in the laboratory, but instead give him what his symptoms and signs show us plainly he needs? Call it the "common sense method" if you will, and no doubt we will get better results.

As to the second step, it is very necessary in a puzzling case to eliminate in some way the grandmother from the equation. I do not depreciate in the least the wealth of practical advice offered by a grandmother who has successfully raised 8 children. She can often tell us whether the crying baby, in a certain case, is hungry or colicky with much more acumen than the trained nurse. But I do believe that in many instances failure has resulted because the attending physician has allowed the baby to remain in the same house with the mother and other devoted relatives even though an experienced nurse was in charge.

---

* Read before the District of Columbia Medical Society, March 16, 1921.

If the visits to a difficult case have to be restricted in time, they had better not be made at all. Such a case cannot be fed hurriedly but requires painstaking attention. Neither should the frequency of visits be limited. In extremely bad cases daily supervision is essential and mild cases should be seen seldom less than once a week. There is nothing more detrimental to the best interests of the baby than the practice commonly indulged in of changing formulas and attending to other details by telephone. Many important essentials are thus left to the discretion of the mother with resultant failure. And yet there are many busy men who never see even a bad case more often than once a month, but change their formulas frequently by phone and then wonder why the infant gets along so poorly.

We also wish to take exception to the common practice of telephoning the formula to milk laboratories, which in turn send the bottles ready prepared to the home. Frequently certain conditions arise which should require an immediate change in one or more constituents, and if the attending physician happens not to have his notes with him or is out of town, much valuable time is wasted in finding out just what the formula is; or the infant is required to wait until the next day before the necessary change can be made. Any intelligent mother can be taught to properly modify the milk at home and we can be assured that in the changing and unreliable labor conditions of the present day it is far safer to trust the formula with the mother than to some frequently inexperienced and disinterested helper in the laboratory. Our attention has been called several times to a discrepancy in the supposedly accurate formula from day to day, so noticeable as to be apparent to the naked eye.

I shall mention the milk supply itself only to sound a note of warning in feeding hospital cases. Some of the milk delivered to most hospitals is of necessity already 24 hours old. It is generally delivered in bulk. If you order a formula requiring top milk, some of this bulk milk has to be bottled and allowed to stand until the cream rises. Frequently, therefore, the formula is not made up until the following day. So that the last bottle of that formula which the baby takes may be 3 days old. Is it surprising that your case may develop some unexpected symptoms?

While the breast-fed baby as a rule offers few serious difficulties there are some important minor points often overlooked. After he is born the accoucheur cheerfully consigns him to the care of his nurse with instructions to put him to the breast every 6 hours until the milk comes in. Occasionally, but more often not, she is told to give him some water. If she is particularly interested, the baby may receive water twice a day but seldom more than once. The result is that it has practically no fluid for 3 and frequently 4 or 5 days and we get a picture of inanition fever often alarming. Several months back I was asked to see such a case in a local hospital: an infant 5 days old with a temperature of 106° and suppression of urine. It was being treated vigorously with hot packs, etc., for acute nephritis, and an effort had been made to catheterize it in order to examine the urine. I was assured that the mother's breasts were full on the third day, but that the baby, after several attempts, refused to continue the nursing. It had been offered water once a day. On careful examination it was found that though the breasts seemed full and firm no milk could be obtained from them. The baby was given water at frequent intervals and in a few hours the temperature dropped and it passed an abundance of normal urine. In 24 hours, after her anxiety over the baby's condition had been relieved, the mother supplied milk plentifully.

New-born infants should receive immediately 1 to 2 ounces of boiled water every 4 hours until the third day when they should be started on modified milk if sufficient breast milk is not supplied by that time. I have never seen "inanition fever" nor a marked case of so-called "physiological icterus" in an infant thus early supplied with fluids.

In 2 cases, one 3 weeks and the other 6 weeks of age, it was found that, although the breasts contained an abundance of milk which flowed easily, the infants had gained nothing since birth and seemed dissatisfied after nursing, even though remaining at the breast ample time. After closely watching them through several nursing periods, we discovered that invariably they would get the nipple *below* the tongue instead of above and of course could get practically nothing. And yet on casual observation they seemed to be nursing correctly. It was only after patient manipulation extending over several days that the mother finally succeeded in overcoming this difficulty.

A nursing mother is often advised when her infant seems to be getting an insufficient quantity, to nurse it from both breasts at a time. Aside from the question whether or not it is advisable and efficacious to use both breasts at one feeding, it is important to instruct her just how to do it. We have frequently seen cases where, having been advised by her physician in such manner, the mother has faithfully done so without regard to rotation, with the result that one breast being always completely emptied and the other never emptied, there is found a marked disparity in their size and secreting capacity.

An interesting and often puzzling type of breast fed baby is that which empties the breast completely, does not gain in weight, cries continually, and shows by various tests that he is not getting sufficient quantity, and yet 1 or 2 hours after feeding develops severe colic with vomiting and green stools. An analysis of the milk in several of these cases has showed a fat content of 5 to 6 per cent. Evidently there is insufficient quantity to satisfy the infant's hunger and what there is of it is too rich for him to digest. This condition nearly always seems to occur in babies under 3 months of age. I have found that these cases gain better when given several ounces of a weak milk mixture instead of water immediately before each feeding and restricting their time at the breast, thus cutting down the fat content without reducing too much the other constituents. The trouble rights itself in several weeks.

Constipation in a breast fed infant is quite common and nearly always overtreated. If the movements are soft, well digested, and the baby is happy and contented, there is no more reason why he should be tortured to make him have a movement every 24 hours than there is in an adult in similar condition. These youngsters may go 36 and 48 hours without being harmed in the least thereby.

It is important to instruct the mother as to the necessity and purpose of giving fruit juices, particularly in bottle babies. Only recently I attended a baby in the absence of the regular physician and found it suffering from scurvy. I asked if it had been given fruit juice. The mother replied, "Yes, the doctor told me to give it orange juice every day, but the bowels got all right so I stopped it."

In feeding the bottle baby we are prone to many errors through haste and neglect of details. A mother is told to feed her infant every 4 hours, and when you make your next visit you may find that she has been giving it the bottle every 4½ hours, presuming, very naturally, that by the 4 hour interval you mean 4 hours from the finish of one feeding to the beginning of the next. This is a surprisingly common mistake. It would perhaps be better if it were generally understood that a 4 hour interval means 4 hours without taking food.

Some of the most serious mistakes are caused by the marked discrepancy in the measurements of nursing bottles. Many a hungry, slow-gaining baby is thus cheated and allowed to cry unheeded because his bottle shows him to be getting the number of ounces ordered when, as a matter of fact, he may be getting considerably less than that by correct measurement. The writer recently tested 6 different varieties of bottles in common use and purchased in the open market and found them to vary one-half to one and one-half ounces from a correct standard measure. Likewise it is common knowledge that the quart bottle of milk delivered at the door does not contain 32 ounces at all but frequently measures only 30 or 31 ounces. The Bureau of Standards has agreed to investigate this question and it is to be hoped something may be done to give the baby justice.

Another source of error lies in the common practice of measuring the carbohydrate foods with a spoon. It is surprising how many intelligent mothers, and nurses, too, become confused over the difference between a tablespoon, soup spoon, and dessert spoon. And there is a wide variation in the capacity of tablespoons. So if it is not feasible to measure the sugars by weight surely there should be a definite understanding as to the use of spoons.

A very frequent mistake is made in attempting to give a certain baby the amount at each feeding of his supposed stomach capacity.

It is well known that a marasmic infant may require double that amount and many apparently healthy babies, particularly those who have had a slow start, are never satisfied with the average quantity. The writer has in mind two perfectly healthy infants, 2 months old, and of average size, who required 8 and often 9 ounces at a feeding over a period of several months before they were satisfied. And never at any time did they show discomfort.

In the matter of preparing the formula, most careful instructions should be given in writing. If boiled milk is used, be sure the mother knows the difference between bubble boiling and simmering, and is instructed concerning the scum forming on top of the milk lest it plug the nipples. She should know that boiling the milk 10 minutes in a double boiler means 10 minutes after the water in the outer pan comes to a boil under the already heated milk and not 10 minutes from the time it is placed over the fire. She should be instructed not to add the alkali or certain prepared sugars until after the formula has been boiled. With a capricious youngster of uncertain temperament, she should purchase many nipples of the same variety lest when the old one is worn out he stubbornly refuse the new kind for many feedings, thus losing valuable ground and causing the mother to blame the formula. She should know how to make holes in nipples and adjust the latter so that the length of the nursing period conform to the needs of that particular infant. Recently with another doctor I saw a marasmic baby, 4 months old and weighing considerably less than when it was born. He had it on an excellent formula which it was digesting perfectly although it had continued to lose. It took its bottle eagerly but, instead of finishing the 5½ ounces given, would, after nursing 20 minutes, fall asleep leaving from 1 to 2 ounces. Without altering the formula, we substituted a faster nipple with the result that he took all his food in 10 minutes, and gained 6 ounces the first week. Many of these infants, particularly those of premature birth, become exhausted and fall asleep if they are required to nurse longer than 5 or 10 minutes.

A personal supervision occasionally of the preparation of the formula in the home by the attending physician would go a long way toward eliminating many errors. And if it were made an invariable rule that the physician should taste of the formulas which he prescribes, many times would the infant be spared the necessity of vomiting some horrible concoction of sour milk and karo or what-not, tried out upon his defenseless stomach.

In an emaciated, marasmic infant of nervous deportment, whose intestinal musculature is so hypersensitive that any formula he is put upon produces colic, it is important that he be not compelled to "cry it out." Such a baby digests his food much better and gains more rapidly if blessed with a certain degree of comfort, and it is truly remarkable what results can often be obtained, when dietetic measures fail, by the judicious use of a few drops of paregoric and peppermint water in each bottle. This is particularly true in that type of either breast or bottle baby where the colic is accompanied by a tendency to frequent stools.

While these few remarks may seem superfluous to most of you, I nevertheless set them down because I have been so frequently impressed by the little errors of omission or oversight made by so many experienced men—errors which at the time seemed trivial but which have converted a potentially favorable result into a failure. The whole question of success in infant feeding may be said to rest upon three factors: *cooperation, close observation* and *common sense.* And the greatest of these is common sense.

3725 Jenifer Street.

FAMILIAL HYPEREXCITABILITY OF THE BRAIN. (Médecine, Paris, Feb., 1922). In a family described, three members had symptoms indicating hyperexcitability of the brain in early life, but after reaching the age of 6, 9 and 12 years the tendency seemed to be outgrown and there were no further convulsions. A fourth member of the family had a brief period of convulsions while teething and again at the age of 18 months, during an infectious process. The convulsions then recurred regularly, and actual epilepsy became installed. Thyroid treatment has been used in epilepsy with success by Claude, and thyroid treatment has been known to promote the repair of nerves after they have been severed. Instances are known of epileptiform seizures appearing for the first time at the menopause. There are a number of such data which suggest an endocrine element in convulsions and epilepsy. This may induce vascular spasms in the brain from hypertonia of the sympathetic system.—*Journal A. M. A.*

ALKALIS IN ACIDOSIS.

By Floyd Clarke, M.D., and Andrew G. Dow, M.D.

Omaha, Nebr.

The term acidosis is really not definite. The word itself would imply that the blood and tissues had become acid in reaction and incompatible with life. Acidosis may be defined as a diminution in the reserve supply of the fixed bases of the blood and other tissues of the body. The condition is one of acid base equilibrium, whereby the alkaline reserve of the blood is interfered with and the normal reaction becomes not acid, but less alkaline. Very little is known of the effect of this diminished alkalinity on the tissues of the body. The analysis of the blood with respect to its alkaline content is taken as an index of the condition in the tissues of the body.

Acids are formed mainly in the body from the combustion of carbon, sulphur and phosphorus. A slightly alkaline reaction is maintained according to Sellards by:

1. Intake of fixed bases in food.
2. Elimination.
    a. of carbon dioxid by lungs
    b. of acid by kidneys.
3. Neutralization of acid in the body by ammonia.

Protection is maintained in the body against acidosis by the presence of 2 weak acids, namely carbonic acid and phosphoric acid. Weak acids produce a minimal chemical change in the blood and are quickly eliminated—carbon dioxid by the lungs and phosphoric acid by the kidneys. Still further protection is maintained because of the presence of a weak solution of sodium bicarbonate. This weak solution is able chemically to take on large quantities of carbonic acid without appreciable change in reaction. The proteins play a part in maintaining the normal reaction and also in protecting the body against either acidosis or alkalosis. They are amphoteric and have the ability to combine with either acids or alkalis without undergoing chemical change themselves. This "buffer" property was originally described by Henderson. By "buffer" is meant that ability of the blood to take on a certain amount of either acids or alkalis without undergoing any appreciable change in reaction.

Very little is known concerning the condition, alkalosis. Rowntree states that there are a great many patients injured with too large quantities of alkalis. It is brought about by the overcoming of the normal alkaline tolerance of the blood and tissues. Its symptoms are manifested by coarse tremors, rigidity and relaxation of the sphincters. J. L. Morse describes a case occurring in a girl 10½ years of age who had received 270 grains of sodium bicarbonate. She developed a tetany with some drowsiness and the passage of large amounts of alkaline urine. In all she had 750 grains of sodium bicarbonate in 5 days.

Alkalosis probably does not occur except as a result of the over-burdening of the blood and tissues with alkalis when administered for therapeutic purposes. Acidosis, or a condition of hypo-alkalinity, on the contrary, occurs not infrequently in pediatric practice. It is quite probable that varying grades of a lessened blood alkalinity occurs, although this fact has not been proven satisfactorily. The condition at times comes suddenly, without warning and with no history of previous disease. Its usual occurrence is, however, a terminal one, following a severe infection of one kind or another. It is particularly common with the severe diarrheas of infancy and childhood. Its most characteristic symptom is hyperpnea, resembling the breathing in pneumonia, but without the expiratory grunt so frequently seen in the pneumonias of infants and children.

Numerous laboratory tests have been described for the detection of acidosis. These are: (1) direct examination of the blood; (2) examination of the urine; (3) estimation of the carbon dioxid tension of the alveolar air. Of these laboratory tests probably the most accurate is the method of Van Slyke.

Schloss and Stetson, in 27 normal cases, found the carbon dioxid combining power of the blood to range from 46 to 63 c.c. carbon dioxid per 100 c.c. of plasma. In 17 out of 19 cases of diarrhea with toxic symptoms, the figures ranged from 13 to 38. If the carbon dioxid combining power with the Van Slyke apparatus is above 40, it is regarded as normal. From 30 to 40 a greater or less degree of acidosis is present, and below 20 is incompatible with life.

It seems to us that the laboratory and the Van Slyke apparatus will be of assistance in differential diagnosis. One of us can recall at least 2 cases where the estimation of the carbon dioxid combining power of the blood would perhaps have been of assistance in differentiating between acidosis and intussusception.

The treatment of acidosis by the administration of alkalis is often unsatisfactory. This failure may in part be due to the fact that acidosis is not readily diagnosed clinically in children until it has reached a far advanced stage.

Rachford states that in his experience bicarbonate of soda in large doses is of no value. He has discarded its use entirely. Chapin and Myers admit that the use of bicarbonate of soda will often stop the hyperpnea and give laboratory results found in normal children. Nevertheless the child may die. Considerable variance of opinion seems to exist as to the dose necessary in our acidosis cases.

Howland and Marriott state that in infants under one year of age as much as 150 grains in 24 hours may be necessary. Chapin and Myers advise 7½ grains for every 40 pounds of body weight. Sellards gives the normal tolerance in adults as 75 grains, and gives this dose every 2 hours in his acidosis cases until the urine becomes alkaline.

Our own experience in the treatment of acidosis with alkalis has led us to believe that if one wishes to succeed in his care of these suddenly stricken children, some treatment other than alkalis is necessary. This statement was so characteristic of our experience that in one instance of post-operative acidosis we injected whole blood subcutaneously with the mother as donor. The patient's prompt recovery was very gratifying.

In order to enable us to determine the proper dosage of a given alkali, the best alkali to be administered, and the ability of the infants to absorb the alkali, a series of experiments was undertaken. We have investigated the carbon dioxid combining power of the blood with the Van Slyke apparatus on 18 infants and young children. Fifteen of these estimations were in infants under one year of age. The blood was usually obtained from the longitudinal sinus.

BY MOUTH

Case 1. Potassium citrate 2 drams
Before —40 urine acid
24 hours after —49 urine acid

Case 2. Potassium citrate 1½ drams
Before —40.9 urine alkaline
24 hours after —44.7 urine alkaline

Case 3. Potassium citrate 2½ drams
Before —39 urine acid
24 hours after —48.5 urine alkaline

Case 4. Sod. bicarb. 1½ drams
Before —39.
24 hours after —47.5

Case 5. Sod. bicarb. 2 drams
Before —39.
24 hours after —48.5

Case 6. Sod. bicarb. 2 drams
Diarrhea, 6-8 loose, green stools in 24 hours.
Before —38.1 urine acid
8 hours after —40.9 urine acid

Case 7. Sod. bicarb. 1½ drams
Before —40 urine acid
8 hours after —46.6 urine alkaline

Case 8. Sod. bicarb. 2 drams
Before —43.8 urine neutral
8 hours after —44.7 urine alkaline

INTRAPERITONEAL

Case 8. Ringer's solution, 30 c.c.
Before —37.2
24 hours after —39.

Case 10. Ringer's solution, 30 c.c.
Before —39.
24 hours after —42.8

Case 11. Sod. bicarb. grs. 20
Before —40
24 hours after —44.7

Case 12. Sod. bicarb. grs. 20
Before —39 urine alkaline
24 hours after —39 urine alkaline

Case 13. Sod. bicarb. 1 dram
Before—39 urine acid
24 hours after —55.1 urine acid
Complete anuria for 24 hours after intraperitoneal injection.

PER RECTUM

Case 14. Sod. bicarb. 4 drams
Before —39 urine acid
24 hours after —46.6 urine alkaline

Case 15. Sod. bicarb. 4 drams
Before —47.5 urine acid
24 hours after —58.9 urine acid
48 hours after — urine alkaline

Case 16. Acute nephritis
Glucose 10 per cent intravenous—250 c.c.
Before —33.4
24 hours after —44.7
72 hours after —42.

Case 17. Pneumococcic meningitis, bronchopneumonia
10 hours before death—30.5

Case 18. Diabetic coma
Sod. bicarb. 3 drams intravenous
1 hour after —16.4

CONCLUSIONS

It would seem from our work in administering soda bicarbonate by mouth, that absorption was very slow, probably too delayed to do much good in our acute acidosis cases.

Ringer's solution when administered by the intraperitoneal route has no appreciable effect in increasing the carbon dioxid combining power of the blood.

A 4 per cent. solution of soda bicarbonate given by the peritoneal route is almost negligible in its effect, in so far as increasing the carbon dioxid combining power of the blood is concerned.

Our observations would lead us to believe that larger doses than a 4 per cent. solution of soda bicarbonate administered intraperitoneally have a very distinct influence in increasing the blood alkalinity, but there at once comes the danger of an alkalosis.

Solutions of soda bicarbonate given by rectum are absorbed, but probably more slowly than by mouth.

The Van Slyke apparatus is practical and will no doubt prove to be of assistance both in diagnosis and differential diagnosis.

In common with other observers, we are led to believe that the alkalis when given in the usual way have very little if any curative effect in acidosis.

We feel that this work is only preliminary to much more work which should be done.

The number of cases which we have reported is scarcely large enough to justify us in drawing more than tentative conclusions which may be changed by further investigation.

It is regretted that we did not have a genuine acidosis case on which we could do a Van Slyke, before and after, but such a case was not forthcoming during the progress of our work.

REFERENCES.

Chapin, H. D., and Myers: Am. Jour. Dis. Child., 18:555, Dec., 1919.
Clarke, F.: Neb. Med. Jour., 3:37, Feb., 1918.
Howland, J. M., and Marriott, W. McKim: Bulletin Johns Hopkins Hospital, 27:63, Mar., 1916.
Morse, J. L.: N. Y. Med. Jour., 112:965, Dec. 18, 1920.
Mercer, Wm. H.: Med. Rec., 98:467, Sept. 18, 1920.
Rachford, B. K.: Archives of Pediatrics, 37:651, Nov., 1920.
Rowntree, L. G.: St. Paul Med. Jour., 19:1, Jan., 1917.
Sellards, A. W.: The Principals of Acidosis & Clinical Methods for Its Study. Cambridge; Harvard University Press, 1917.
Schloss, O. M., and Stetson, R. E.: Am. Jour. Dis. Child., 13:218, March, 1917.

Chronic Intussusception (Medical Journal of Australia, Sydney, March 11, 1922). Schlink's patient, aged 7, recovered from the acute symptoms which accompanied the invagination of the cecum as well as the ileocecal valve and lower part of the ileum into the ascending colon. Peristaltic action gradually passed the intussusception on until the apex lodged in the rectum. The patient lived 2 months after the onset of the trouble as if the large, bowel had been excised. No blood appeared per rectum either during the acute initiation of the intussusception or during its progress along the ascending, transverse and descending colons, or while resting in its final position. Reduction was affected and the patient made an uneventful recovery.—*Journal A. M. A.*

RETROPERITONEAL SARCOMA IN CHILDREN WITH REPORT OF A CASE.

By S. G. Glover, M.D.

Greenville, S. C.

From the little that I can find on this subject, the majority of retroperitoneal tumors arise from the kidneys. The origin of the tumor, in the case I am reporting, is extrarenal and for this reason I consider it a rather rare condition.

Goebel has tabulated 101 cases, but one must take into consideration the fact that they include benign connective tissue growths, as lipoma, fibroma, fibromyoma, ovarian cyst, various types of sarcoma, rare carcinomas, teratomas, cysts, and 4 adrenal rest tumors. All these, however, were not confined to children.

Retroperitoneal tumors are divided into: renal, adrenal, and extrarenal, and may occur along the suprarenal vein, solar plexus, and inferior surface of the liver. In the renal type, you have hypernephroma, sarcoma, hydronephrosis, and congenital cystic tumors. The adrenal types are hypernephroma, fetal rests, and the extrarenal, include sarcoma of lymph nodes and muscle, also lipoma, and fibroma.

Enlargement of the abdomen is very common in infancy and early childhood as a result of disturbance of digestion. Enlargement, while usually due to this cause, may however be due to more serious conditions such as sarcoma, ascites, tubercular peritonitis, Hirschsprung's disease, liver, spleen, or ovarian cyst.

CASE REPORT.

A. M. H., female, white, age 9 months, entered the Greenville City Hospital pediatric service on Oct. 14, 1921, with a diagnosis of distended abdomen.

Family History. Father and mother both living and well. Mother, one miscarriage about 4 years ago; one child dead, aged 3 months, cause, yellow jaundice; 3 children since then. Mother had series of chills 2 months ago, duration 2 weeks, supposedly malaria. No tuberculosis in family. This baby, labor normal, duration one hour. Other family history negative.

Previous History. Baby still nurses breast, but is given also a little soft food, such as cream of wheat, egg, biscuit and milk, occasionally. No other previous history; never been sick before.

Present Illness. About 2 months ago abdomen began to swell, knot appeared in left side about the size of a hickory nut, no discomfort, no distress, always seemed hearty, but abdomen gradually became larger, appetite good, bowels regular.

Physical Examination. Female, white baby, about 9 months of age. General appearance satisfied, not crying, anterior fontanel not closed, eyes negative, mucous membrane negative, tongue negative, throat negative, heart negative, arteries negative, lungs negative, abdomen greatly distended, circumference at umbilicus measuring 22½ inches, firm and solid, enlarged or dilated veins prominent over abdomen, no umbilical hernia, 3 distinct masses felt in abdomen, no free fluid. Liver not palpable, but there is a distinct, large hard mass felt in this region. Spleen not palpable, kidneys negative, lymp nodes negative, reflexes negative, sexual organs negative, rectal temperature 101.4°.

Provisional Diagnosis. Sarcoma abdomen.

Blood Count. Leucocytes, 23,000; polys, 55 per cent.; eosinophiles, 0; basophiles, 0; transitional, 8; small lymphocytes, 35; large lmyphocytes, 2; an occasional normoblast; erythrocytes, 3,800,000; hemoglobin 65-70 per cent.; color index, 0.9; coagulation rate, 4 minutes; Wassermann negative.

Urinalysis. Color straw, appearance cloudy, reaction acid, specific gravity not sufficient quantity, hyaline and granular casts negative, few pus cells, blood negative, albumin negative, sugar trace, acetone and diacetic acid negative, squamous, transitional and renal cells negative, calcium oxalate and urates positive.

Von Pirquet Test. Negative.

X-ray Report. Lungs appear negative; there is a tumefaction apparently arising from left kidney or spleen, filling practically the whole abdominal cavity.

Final Diagnosis. Sarcoma abdomen. Patient was transferred to surgical service on Oct. 16, 1921.

Surgical service concurred in diagnosis. X-ray, after barium meal on Oct. 17, showed the viscera pushed to the right side of the abdomen. On Oct. 19, a laparotomy was performed, left rectus incision, a retroperitoneal tumor being found which was solid, and extended from the brim to right upper quadrant, also to left upper quadrant, adherent to the intestines, but not to either kidney, and arising supposedly from the glands along side of the spinal column in the lumbar region. It could not be dissected from without and there was very extensive bleeding. A loop of intestines was found in the depression between the upper and lower lobe of the tumor. The condition was thought to be inoperable so the abdomen was closed.

Additional Diagnosis. Retroperitoneal sarcoma of abdomen. Outcome: Patient died Oct. 20; autopsy requested but refused.

Discussion. Sarcoma is the most common of the malignant abdominal tumors. The tumor is the first thing noticed. It usualy grows rapidly, and may fill the abdomen in 3 months. Hematuria is not present unless the kidney is involved. Pain is generally a rare and late symptom. Pressure symptoms depend on the size and situation of the tumor. The appearance in a child under 5 years of age of a mass in the abdomen, rapidly growing, filling the abdomen in 3 or 4 months, and the character being firm and hard, would make one highly suspicious of sarcoma. Malignant tumors may be mistaken for hydronephrosis. If so, an exploratory puncture would yield fluid with urinary constituents in the latter disease. Ovarian cysts are differentiated by a bimanual examination through the rectum and abdomen, best done though under anesthesia. Kerr states that retroperitoneal sarcoma may be an irregular tumor of large dimensions, felt in the lower portion of the abdomen, or sometimes in its lateral portions between the crest of the ileum and the lower ribs, and in this lateral situation may simulate a sarcoma of the kidney. The differentiation is made by the more central position of retroperitoneal sarcoma and the normal condition of the urine, however, an exploratory incision is sometimes necessary to distinguish it.

CONCLUSIONS.

Dr. G. T. Tyler, who operated on this child, states that a retroperitoneal tumor was found adherent to neither kidney, but arising from the glands alongside of the spinal column in the lumbar region.

I would believe then, from the surgeon's laparotomy, and also from the fact of the urinalysis showing hematuria to be absent, that this tumor originated extrarenally.

CASE REPORT.

CONTRIBUTED BY WILLIAM L. ROST, M.D.

New York.

CASE NO. 28.* Female, 12 years old.

That syphilitic involvement of the thyroid, with or without signs and symptoms of hypersecretion, is of rare occurence, is amply substantiated by the paucity of such case reports in the literature.

Demme[1] in 1879 reported 3 cases of congenital lues in children in whom gummatous nodules were found in the thyroid.

Moritz Furst[2] reports the case of a child born with a goitre of considerable size; he believed this to be luetic. The father had syphilis and the mother received a course of anti-syphilitic treatment during her pregnancy, as she had previously given birth to a still-born luetic child; he describes that each lobe was as large as a walnut; the swelling almost entirely disappeared spontaneously within 6 weeks of birth.

Clark's[3] very interesting case was one of undoubted congenital lues in a female, who, at the age of 12, had epileptiform convulsions and at 19 began to suffer from palpitation, tachycardia, violent attacks of nervousness, swelling of the throat and slight ocular protrusion; she had a positive Wassemann, also her mother; under anti-syphilitic therapy she improved.

L. Thompson's[4] article is an epitome on this subject giving an almost complete bibliography up to 1917. He includes his own case that of an adult aged 72 with syphilitic involvement of the thyroid who improved with anti-luetic treatment. His conclusions are worth quoting and are as follows: 1. That syphilis of the thyroid is rare but would probably be more often recognized if looked for more frequently. 2. The disease may occur as an early or late manifestation. 3. It is observed more frequently in females. 4. The histological findings of early involvement has not been described, while the later involvement resembles greatly tuberculosis of the gland. 5. The clinical manifestations may be tumefaction only, or there may be marked symptoms of goitre, exophtholmos, tachycardia, tremor, etc. 6. The prognosis depends upon how early the condition is recognized. 7. The therapy is anti-syphilitic as well as symptomatic.

---

* Hyperthyroidism with Marked Toxic Symptoms Due to Congenital Lues. Improvement with Anti-luetic Therapy.

Case presented before the New York Academy of Medicine, Section on Pediatrics, May 12, 1921.

H. H. Hazen[5] gives a brief review of the literature and cites the history of a colored girl with secondary syphilis who after being under treatment for some time (receiving no iodides) developed tumefaction of the thyroid and signs of vagotonic hyperthyroidism. He referred the case to Dr. Reed (an endocrinologist) who stated that the patient had previously had Graves' disease. He further states that one would naturally think that gummous formation where there is a destruction of tissue would cause an hypo-function. This was not so in Clark's or Thompson's patients (nor in our own case). It would seem, he says, that perhaps luetic changes in one portion of the gland may stimulate the remainder to hypersecretion.

CASE REPORT. F. A., 12 years of age, born in Russia, presented herself at our clinic at Mt. Sinai, June 12, 1919, complaining that for several days she had pains and aches in her extremities, loss of appetite, some head-ache and cardiac palpitation, the bowels were regular, there were no urinary disturbances.

Previous History. She was a full term baby, the third of 5 children and was breast fed. She had pertussis at 2 years, scarlet fever at 3½, measles at 7 and a tonsillectomy at 8 years of age. When 5 years of age she was brought to our clinic because of poor physical development and enlargement of the abdomen, with what appeared to be manifestations of late rickets; under treatment her condition improved and was lost sight of until 1919.

Family History. Both parents living and well, 3 other children living and well, no history of abortions, tuberculosis or lues.

Physical Examination. She was 58 inches tall and weighed 51 pounds. (She was 27 pounds under weight and 4 inches short of her normal height). The general condition was very poor, she spoke with a tremulous voice, flushed readily, was ready to cry at the slightest suggestion and seemed very alert. The skin of the hands and feet were mottled and on extending her arms and hands she displayed a fine tremor of the fingers. The eyes were very prominent and lustrous, Stellwag's and Von Graef's signs were present. The teeth and gums were in a very poor condition. The faucies were negative. The thyroid was very much enlarged, smooth and even in outline. The heart was not enlarged, action regular and overactive, no murmurs audible. Pulse rate 120 per minute. The lungs were negative. The abdomen presented a mass in the right hypochondriac region continuous with the liver extending to about 4 fingers below the costal margin, was irregular in outline and hard to the touch. The spleen was not palpable. The only superficial glands that seemed somewhat enlarged were the post-cervical. There was marked tache and the rectal temperature 100°.

The von Pirquet test was distinctly positive. The urine was negative for albumin, sugar and, microscopically, no pathological elements were found. Roentgen ray of the abdomen revealed an enlarged liver. Blood examination showed hemoglobin 46 per cent.; red blood cells 4,500,000; white cell count, 11,600; polys., 54 per cent.; small lymph., 46 per cent.; marked poikilocytosis and anisocytosis.

The case was considered one of a pre-menstrual state, with malnutrition and treated as such. She visited the clinic from time to time during the following year, presenting practically the same clinical picture as that described. The temperature ranged between 98.8° and 102°; the pulse between 112 and 120. The pains and aches grew worse, she became very nervous, could not sleep nights, head-aches and pains in the eyes became very marked and her weight oscillated. Examination of the eyes revealed slight error of refraction which was corrected and the head-aches ceased. In spite of al our efforts the patient grew progressive-worse and became so weak that in July, 1920, she was compelled to stay in bed for 9 days. In August of the same year she returned to the clinic complaining bitterly of pain in her right elbow joint which was slightly inflamed and exquisitely tender; all forms of therapy to allay her suffering proved futile. September 2, 1920, a blood Wassermann test was 4 plus, all the other members of her family except the father had decidedly positive Wassermanns. The patient was immediately referred to the salvarsan clinic in charge of Dr. Chargin and after 3 injections a most remarkable change for the better took place; her pains disappeared, the tremor was less marked and it seemed as if the thyroid tumefaction was receding. The liver mass became smaller, her appetite improved, she slept better and gained 4 pounds, 10 ounces in weight.

She is still under treatment and is constantly improving; at present her weight is 75 pounds, height 56 inches and she feels splendid. The thyroid enlargement has practically disappeared, the tremor is not present, the pulse rate 84, has no palpitation or tachycardia, the eyes have lost their stare and the liver mass is very much smaller. Up to the present time she has received 12 salvarsan injections of 0.2 (decigrams) each, besides mixed treatment.

BIBLIOGRAPHY

1. Demme: Krankheiten der Schilddrusen, Bern., 1879.
2 Moritz Furst: Berl. Klin. Wochen., 1898, xxv, 1016.
3. Clark. Jour. A. M. A., 1914. Lxiii, 1951.
4. Thompson L: Am. Jour. Syph., Jan., 1917, 179.
5. Hazen, H. H.: Am. Jour. Syph., Apr., 1919, vlll, 205.

Acetonemia in Children (Bulletin de l'Académie de Médecine, Paris, March 14, 1922.) Remond reports a further series of 5 cases of acetonemia in children, with headache, intolerance of the stomach, chilliness and syncopal condition, and pure mucus passed by the anus. The head of the pancreas was tender in all, and the acetone surpassed 1.5 gm. per liter of urine. The latter contained notable portions of diacetic acid. In a sixth case the child died in one of the attacks. He gave alkaline treatment to all, but in 2 cases the phenomena promptly subsided under injection of pancreas extract. These 2 children (7 and 9) complained that the injection hurt; but that this was far preferable to the severe headache they had been having. The pain subsided in half an hour after the injection. These experiences have convinced him that acetonemia is the result of acute insufficiency of the pancreas. He calls attention in conclusion to the significant fact that inherited syphilis was present in every case, direct in 3 cases, and from a preceding generation in the others. There were no manifestations of the syphilis apparent, but the history was beyond question. There is thus reason to assume, he says, that acetonemia and acidosis in children are the result of insufficiency of the pancreas, and that this is a manifestation of inherited syphilis.—*Journal A. M. A.*

CLINICAL DEPARTMENT

CASES CONTRIBUTED BY

JAMES HOYT KERLEY, M.D., New York
CHARLES HERRMAN, M.D., New York

CASE No. 26.* Male, 2 years old.

The following case is of interest because of the analogy of its clinical findings and symptomatology to a condition described by Ritter[1] which occurs during the first few weeks of life, and which has been named for the author.

Ritter's disease, or exfoliative dermatitis, consists primarily and essentially of inflammation of the skin with exfoliation, the formation of vesicles being only a secondary symptom. The disease begins generally on the face, at the angles of the mouth, and under the chin, but may begin on the abdomen or genitals. The first change is a bright diffuse reddening and swelling of the skin, which gradually spreads over the entire body resembling erysipelas at this stage.

The skin of the affected part looks thinner and more transparent as if the horny layer had been swollen and macerated by long continued moist and warm compresses. The epidermis becomes loose from the corium so that there is a vesicular bulging of the former. Large areas of superficial skin appear to be soaked in serous fluid and a condition of epidermolysis and exfoliation follows.

The course of the disease varies. It may spread rapidly over the entire body so that in a few days the skin may hang in shreds, exposing almost everywhere a very red and livid corium, infants so affected dying in a few days, or its course may be slower, remaining at its height for over a week and subsiding slowly and ending in recovery.

It is difficult to separate this disease from acute pemphigus. The former is marked more by exfoliation and the latter by exudation. Pemphigus does not begin with an erythema and its vesicles are outlined by a well defined inflammatory border, while in dermatitis exfoliativa the inflammatory borders are rarely rounded but ragged and irregular in outline.

---

* Exfoliative Dermatitis with Fatal Termination following Tonsillectomy.

Paper read before the New York Academy of Medicine, Section on Pediatrics, October 13, 1921. For Discussion see ARCHIVES OF PEDIATRICS, February, 1922. p. 122.

The clinical history of the disease justifies its being considered of a septic nature. Staphyloccocci are usually found in the skin and generally in the blood also. Although we may not be sure where the infection enters, there is every probability of bacterial processes playing the most important part in exfoliative dermatitis.

Patek[2], following Ritter's classification of symptoms and course, arranges the disease in the following stages: (1) Prodromal; (2) erythema and exudation; (3) exfoliation and exsiccation; (4) regeneration of epidermis with desquamation; (5) furunculosis and abscess formation.

The prodromal stage consists of dryness of skin and desquamation of branny scales.

The erythematous stage varies much in degree, usually beginning on the lower half of face or about the mouth. The redness may be faint at first but deepens and is followed by a generalized erythema. At the same time rhagades form at the corners of the mouth and soon the mucous membrane of the oral cavity shows characteristic appearances. It is hyperemic, miliary plaques are present, and on the palate are large irregular patches of denuded epithelium covered with grayish white exudate. The turgescence of the skin continues and the extremities are involved last.

The stage of exfoliation shows marked skin changes. The epidermis, both on the face and body, becomes dull in color, wrinkled into folds, and easily torn off at the slightest contact. The almost denuded cutis is dark red and raw looking but soon dries and becomes dull, shreds of dry and dead epidermis clinging to the denuded surface. This separation of the epidermis from the cutis may take place without any exudation of serum.

The process involves the neck, chest, back and abdomen. Wherever the hands touch the body at all forcibly, the epidermis is loosened into folds and leaves the cutis exposed or covered with a non-protecting dead outer covering. The appearance is that of an extensive superficial burn, so complete is the maceration and exfoliation. The extremities are usually affected last and not as severely as the trunk, with the exception of the hands and feet, which suffer extremely, their entire surfaces being laid bare and shuffling off like a glove.

The denuded surfaces desiccate and regenerate in the order of their onset. The skin loses its raw, moist appearance, the deep red changes to a lighter pink, dry branny scales develop, and the regeneration of the epidermis proceeds rapidly. The whole process rarely lasts longer than from 7 to 10 days, and in some instances hardly a week elapses from the onset of the hyperemia to the formation of normal regenerated epithelium.

As sequelae may be mentioned a persistent extensive eczematous condition, or furunculosis and abscess formation.

REPORT OF CASE.

History. Male, aged 2 years, seen at home.

Family History. Unimportant.

Previous Illness. Negative, except that the child developed head colds because of which the adenoids had been removed a year previously.

Present Illness. Four weeks before being seen, the parents stated that the tonsils and adenoids had been removed. This was followed by a discharge from both ears which had continued up to the present. The temperature had been variable, ranging from 104° to normal. The child had become very irritable and for the past few days had been in a stuporous semi-conscious condition. Three days ago the mother noticed dark red areas about mouth and on head and chin which had spread to the arms and chest.

Physical Examination. Well developed and nourished male child, acutely ill. Patient appears in a semi-comatose condition from which he can be aroused by manipulation, uttering, when awakened, a high pitched shrieking cry resembling the "meningeal cry." Temperature 101.3°. Both ears perforated and slight serous discharge present. No sign of mastoid involvement. Tongue heavily coated. Gums inflamed and swollen and also salivating. Grayish white ulcerated areas present on cheeks, tongue, and lips, attended by a fetid breath. Bases of tonsils can be seen red and swollen. Lungs negative. Heart sounds regular but rapid and of poor quality. Liver and spleen not made out. About the mouth and chin are areas of brownish coppery discoloration with patches of livid eruption on the face and scalp. On both shoulders are large pemphigoid areas which have ruptured. On arms, trunk, and extremities are dark erythematous lesions with remnants of blebs on the trunk. Smaller hemorrhagic patches, livid in color, and bluish, appear over temporal regions, and on the body.

Laboratory Findings. Urine acid, turbid, heavy trace of albumin, no sugar; microscopically, many leucocytes and much clumping of leucocytes. Too ill for blood culture.

SUMMARY.

The history and physical findings of this case point strongly to a systematic hematogenous sepsis resulting probably from absorption of bacteria or toxins from the operative wound. The discoloration of the face, coppery colored, the livid areas on the face, head, and body, and the pemphigoid condition of the skin strongly resemble what is seen in the new-born as dermatitis exfoliativa (Ritter's disease).

I would like to express my appreciation to Dr. Henry Koplik, who also saw this case, and who offered me several helpful suggestions.)

BIBLIOGRAPHY

1. von Reuss, August Ritter: The Diseases of the New-born, Ed. 1, 1920, 406-408. John Bale, Sons and Danielsson, Ltd.
2. Patek, A. J.: Dermatitis Exfoliativa Neonatorum, Jour. Cut. Dis., inc. Syph., 22:269-275, 1904.

JAMES HOYT KERLEY.

CASE NO. 27.* Female, 20 months old.

A. B., first seen on May 15, 1921, at the age of 20 months. The parents are apparently healthy. They have been married 6 years, and have one other child of 4 years. One child died in infancy with erysipelas. The mother has had no miscarriages or stillbirths. The labor was normal at full term, and the infant weighed 7½ pounds at birth. It received the breast for 10 months, and was healthy until 7 months of age, when, after an attack of indigestion with loose green mucous stools, it began to grow pale. At 10 months after weaning, the child had another attack of indigestion, and the anemia became more marked. The first teeth appeared at one year. The child can stand, but she cannot walk alone. She can say single words, and is apparently of normal intelligence. The appetite is poor, there is no vomiting, the bowels

---

[*] Secondary Anemia Associated with an Enlarged Spleen, with Report of a Case in an Infant Twenty Months Old.
Read before the New York Physicians' Association, October 27, 1921.

are fairly regular, but frequently the movements have a disagreeable odor. She coughs occasionally, and sleeps fairly well. At present the diet consists of milk, about a pint a day, a small quantity of chicken, spaghetti, potatoes, bread and fruit juice. She will not take cereals.

On examination the baby was found to be very pale, weight 17½ pounds, temperature 100°. She has 14 teeth, the anterior fontanel is closed, there is no craniotabes, no distinct rachitic rosary, no enlargement of the epiphyses. A few coarse râles are heard, but there is no evidence of tuberculosis infiltration. No cardiac murmur. The edge of the liver is felt 5 centimeters below the costal margin in the right mammillary line, the spleen extends 6 centimeters below the costal margin in the anterior axillary line. The cervical, axillary, and inguinal nodes are enlarged, the epitrochlears are not palpable. Examination of the urine shows nothing abnormal; examination of the stool, no intestinal parasites. The blood shows, on June 13th, 40 per cent. hemoglobin; 2,224,000 red blood cells; 10,400 white blood cells, of which 60 per cent. were polymorphonuclear, and 40 per cent. lymphocytes. A differential count, a few days later, showed 58 per cent. polymorphonuclears, 38 per cent. lymphocytes, 2 per cent. transitionals, and 1 per cent. each of eosinophiles and mast-cells. A few normoblasts were seen. There was poikilocytosis and anisocytosis. A roëntgenologic examination of the chest showed peribronchial thickening in the upper portion of both lungs, swelling of the root nodes, and a few pin head areas of infiltration extending from the hilus into the left upper lobe. A tuberculous infection could not be positively excluded. The heart showed some enlargement to the right and left. The bones showed no distinct rachitic changes. The von Pirquet and the Wassermann tests were negative.

The amount of carbohydrate food in the diet was reduced, and green vegetables added. A rectal irrigation was given once a day. On June 27, the child was given a transfusion of 100 c.c. of the mother's blood. From this time the child's appearance and general condition improved, she gained in weight, and became more playful. In September, at the age of 2 years, she could walk alone, also had her first teeth, and looked well. The blood showed 60 per cent. hemoglobin, 3,600,000 red blood cells, 10,200 white blood cells, no nucleated red cells, and no abnormal white cells.

I have spoken of this as a case of secondary anemia associated with an enlarged spleen advisedly, for the term anemia pseudoleukemia infantum is being discarded. It is too long, and it is to a certain extent misleading insofar as the disease bears no relation to pseudo-leukemia. Splenic anemia of infants is also objectionable because the condition is distinct from the splenic anemia of adults, the chief points of difference being the increase in the number of white blood cells, and the presence of normoblasts and megaloblasts. Most authors are agreed that the secondary anemia of infants is the best term. There is no advantage in dividing these cases into 3 types according to the number of leucocytes, the color index, and the number of normoblasts, for they simply represent different degrees of severity and merge into each other. The blood picture may change from day to day. However, the severer cases usually have a higher white cell count, and more marked changes in the blood picture.

As cases of secondary anemia associated with an enlarged spleen are not uncommon, a few words with regard to etiology and treatment may not be without interest. There can be little doubt that heredity plays an important rôle in the etiology of some of these cases. Certain infants appear to be born with an inferior hemopoietic system. In some there is a history of pallor from birth. Miller recently reported a case in a child 6 weeks of age, in whom, as there was no evidence of any other disease, and as the infant was breast fed, a congenital origin must be assumed. It is relatively more common in twins. I have myself observed 4 pairs of twins with this condition. Hutchison emphasizes this higher incidence in twins, and gives a very plausible explanation, namely that the reserve iron supplied by the mother through the placental circulation, and stored up in the liver, is divided so that each twin receives only one half the regular amount. This small reserve is exhausted at an early date before the child receives mixed feeding. Even if an inferiority of the hemopoietic system were present from birth, it is conceivable that it might remain latent, until some additional unfavorable factor, such as syphilis, tuberculosis, or a gastrointestinal disturbance brought it to light. It seems a mistake to search for one and only one etiologic factor;

it would appear more rational to consider the blood as a tissue, which, when the hemopoietic system is below par, reacts by showing certain changes, which have been spoken of as "a reversion to the fetal type of hemopoiesis." That rickets should frequently be present in these infants is not surprising, for it is the most common of all the nutritional disorders, and the same factors which cause its appearance, may very well bring out the latent inferiority of the blood forming system. That rickets is not essential is shown by a number of undoubted cases in which no rachitic manifestations were present, and we frequently see cases of marked rickets which are free from these characteristic blood changes and the splenomegaly. A number of French authors, Hutinel, Marfan and others, are inclined to believe that a majority of these cases of secondary anemia with splenomegaly are due to syphilis. This may be due to a difference in clinical material. Certainly most of the patients whom I have seen have been free from any evidence of specific infection, that is the Wassermann reaction was negative, there was no rhinitis, no cutaneous manifestations, and they recovered without antisyphilitic treatment. Many were associated with disturbances of the gastrointestinal tract.

In these anemic children, the character of the diet undoubtedly plays an important part. On account of their weakness, it is assumed that they cannot take anything but milk. The deficiency of iron in milk is probably not the sole cause of the anemia, for many infants do not develop an anemia on a milk diet. We must assume an individual susceptibility, due to an inferiority in the hematopoietic system.

Treatment. These infants are very susceptible to infection, especially of the respiratory tract. A large number of the deaths are due to bronchopneumonia. Where the conditions admit, home treatment is preferable to hospital treatment, because there is less danger of exposure to such infection. If the child is on an exclusive or nearly exclusive milk diet, the quantity of milk should be reduced, or in some cases it may be necessary to eliminate it altogether. Meat or meat juice, fresh vegetables, vegetable juices or vegetable powder, and fruit or fruit juices should be added to the diet. If the child is syphilitic, anti-specific treatment is of course indicated. When rachitic changes are present, antirachitic treatment should be given, fresh air, sunlight, and the administration of cod liver oil and phosphorus.

A few cases have been reported in which radiotherapy has been of benefit. The size of the spleen can be reduced in this way, but whether the underlying disease is really affected remains to be proven. Transfusion is of value. In addition to supplying a certain quantity of fresh blood, it may serve to stimulate the hematopoietic system. In infants only a small quantity of blood is needed, and is furnished gladly by one or both parents. If the mother's blood is used, no hemolysis test is needed. Splenectomy has been performed in a number of cases. In a case which I had under treatment a few years ago, the improvement with the usual treatment was not rapid, and the parents took the child to one of our large hospitals, where a splenectomy was done. The child died a few days later. The unfavorable results are not always reported.

The enlargement of the spleen in these cases may be compensatory, as Stillman says, "in all 3 of our cases the spleen was the site of active blood regeneration, and it is difficult to see how the patients could derive advantage from the removal of such an important centre for the formation of new blood cells." However, a number of cases have been reported in which the removal of the spleen was followed by improvement. In Pool's case marked improvement took place during the 2 months following the operation, then there was a retrogression and the patient died of bronchopneumonia a few months later. Wolff's case was followed for 3 years and was apparently well at that time, although it still had a leucocyte count of 20,000; Graff's case had almost a normal condition of the blood nine months after the operation; Fowler's case was followed for only 5 weeks, and had but little change in the blood except an increase in the percentage of hemoglobin; one of Stillman's cases was an infant, and was apparently well 18 months after the operation. In a recently published paper on "Splenectomy in Splenic Anemia and Banti's Disease," William Mayo says, "von Jaksch has described an enlargement of the spleen in infants, due to malnutrition, which usually disappears on proper feeding, but some of these patients do not get well, and the enlarged spleen and chronic anemia are carried into early childhood. We have removed 8 spleens in such children without an operative death, and when the condition has not been too advanced cure has followed. The spleens removed have shown the characteristic generalized fibrosis and thrombophlebitis." Although no case histories are given, these were undoubtedly severe cases. Apparently they did not all do well. As it is not stated how long they were followed it is impossible to say whether the improvement was permanent.

CONCLUSIONS.

1. The secondary anemia of infants, in many, if not most, cases is primarily due to an underlying congenital inferiority in the blood forming system.

2. Other diseases, syphilis, tuberculosis, rickets, and gastrointestinal disturbances may serve to bring to light this latent inferiority.

3. An exclusive or nearly exclusive milk diet, plays an important rôle in the production of the secondary anemia.

4. The changes in the blood represent a reaction of one of the tissues of the body to certain injurious influences. The effect may be similar, although the causative factors may be different.

5. The secondary anemia of infants may be of all grades of severity. The changes in the liver, spleen, bone marrow, lymph nodes and blood are not pathognomonic for any special form, and taken alone give no clue as to the causative agent.

6. Dietetic treatment, the reduction or elimination of cow's milk, and the addition of meat, vegetables, and fruit, is usually followed by improvement.

7. Associated diseases, syphilis, rickets, etc., should be treated in the usual way.

8. Blood transfusion is a useful procedure.

9. As the majority of these patients can be successfully treated by non-surgical measures, splenectomy should only be considered as a last resort, when all other methods fail.

CHARLES HERRMAN.

SOCIETY REPORT

THE NEW YORK ACADEMY OF MEDICINE. SECTION ON PEDIATRICS.

Stated Meeting, Held February 9, 1922.

Marshall C. Pease, M.D., *in the chair.*

ORAL SEPSIS IN CHILDREN.

Dr. Henry Sage Dunning stated that it was more difficult for children to keep up the line of defense against oral sepsis than it was for adults. The child's resistance was not as good as that of the adult, and hence the child was handicapped in his fight against infection. Again, the child did not appreciate the necessity of oral hygiene and therefore it was more difficult to see that he applied it. Among children, oral sepsis was very common. One estimate showed that 80 per cent. of all children had it. It had been shown that many systemic diseases and disorders could be attributed to oral sepsis. Oral sepsis frequently explained a loss of weight, because of the fact that a child did not sleep well when irritation was being caused by his teeth. Furthermore, a child did not masticate well when he had tender teeth. Infection in the teeth caused gastric disturbances, fretfulness, loss of sleep, diarrhea, loss of appetite and many other diseased conditions. A deep apical infection did more harm than an infection of the tonsils because the drainage from the tonsils was better than from the apex of a tooth. It must also be remembered that secondary lesions themselves became additional foci of infection, and these must not be mistaken for the primary infection. Still other conditions that might have their source in oral sepsis were otitis media, meningitis and glandular involvement. Dr. Dunning gave a lantern slide demonstration showing some of the extremely serious local conditions that not infrequently resulted from neglected oral sepsis in children. He called attention to the fact that mothers who were very particular that a child should wash the hands were neglectful of the child's mouth hygiene, principally because it became exceedingly irksome to follow up the matter systematically. Parents should see that children formed the habit of cleaning the teeth twice a day and should not entrust this duty to a nurse. When 3 or 4 years of age, the child should be introduced to the dental nurse, the majority of whom cleaned teeth better than did the dentists; the dental hygienists did this work thoroughly and without causing pain. It was the duty of the general practitioner and the pediatrician to prevent infection of the teeth in children. It had been found that it could be prevented in the families of the rich, but it had not been prevented in the families of the poor. Among the poor the child was seldom brought for dental care before the teeth had begun to decay and the child suffered pain. There was a need for more dental clinics and particularly for dental clinics for children. Several hospitals had established clinics for the care of oral conditions but there were not nearly enough such clinics. All general hospitals should have dental clinics with adequate staffs. Frequently the treatment of oral sepsis was surgical; it took courage to condemn the teeth and say they must come out, so frequently nothing was done, and sometimes results were disastrous for a virulent infection could cause a great deal of destruction in a short time. In curetting an alveolar abscess, the surgical technic should be the same as would be employed in other localities; this was a precaution which had been sadly neglected. Few men believed in the extraction of many teeth at one time, owing to the possibility of a severe reaction. The reaction, however, was not as severe in children as in adults. They seemed to have better recuperative powers and were seldom overcome by the letting loose of a great number of bacilli. Better results would be obtained in the treatment of children when the pathology of the mouth was understood by physicians and pediatricians. The pediatrician should be able to test the vitality of teeth and to read an x-ray plate of the jaws. One frequently heard it said that the first teeth should be conserved as long as possible in order to avoid deformity. Dr. Dunning believed that this was wrong, and even if it were true that the removal of the first teeth would cause deformity, such deformity would be better than infection. He had frequently seen a child, pale, anemic, and in poor condition, after having the teeth properly attended to, suddenly begin to gain weight, the cheeks become rosy, and the general condition bettered to a most remarkable degree. When one saw results of that kind he could not help being impressed with the importance of the whole question of dental sepsis.

A CONSIDERATION OF DENTO-FACIAL MALDEVELOPMENTS IN CHILDREN.

DR. ALFRED PAUL ROGERS, Assistant Professor of Orthodontic Research at Harvard Dental School, read this paper which was liberally illustrated by lantern slides. He stated that in the course of its development the profession of medicine had given slight attention to the diseases and deformities of the oral cavity involving the teeth. Years ago the care of these parts was entrusted to the infant profession of dentistry, whose early history indicated a limited conception and crudeness of practice. In the subject to be considered, the facilities for instruction seemed to be inadequate, in most colleges, judging from the general understanding of the subject by the graduate.

Irregularities of the teeth and malocclusion were now regarded as symptoms of some very much more serious condition, manifesting arrested development of the osseous tissue comprising the alveolar processes and adjacent bones, or maldevelopment of the bony tissues having its origin in some systemic condition. Severe dento-facial maldevelopments were prevalent in all civilized races, and to a slight extent in some primitive races. These defects were not confined to any one social class. However, the severe cases, it might be said, were more apt to be found among children whose life histories showed arrested development following periods of lowered vitality. Such maldevelopments were not confined to the teeth and dental arches alone, but in the severer cases seemed to involve the contiguous bony structures of the mandible and the soft tissues of the face. The solution of the problems presented by dento-facial maldevelopment was to be found in the study of growth and development, structure and function. The influence of heredity as an etiological factor in malocclusion was not yet clearly understood. We knew that certain facial features, such as the shape and size of the eyes, nose and chin, were generally characteristics of certain families. These clearly defined developments were, no doubt, germinal in character, and were, therefore, inherited; but the malformations which he was considering at present were those which seemed to be acquired. At present we placed the responsibility for many of these distressing developments upon the environmental surroundings of the child, the influences of which might be within our power to modify. Climate no doubt played a great part. Normal stimuli were not to be found in the dried out superheated air of the modern dwelling. Another influence might be found in our selection, method of preparing, and manner of eating our foods. Maldevelopment of arches, Dr. Rogers was convinced, might be traced to such conditions. Functional activity or use was one of the most important factors of development. It was response to stimuli, which might be external or internal in origin, which influenced development.

There were certain obvious etiological factors of a mechanical nature, among which was the premature loss of the deciduous teeth, interfering with the growth processes involved in the mechanics of development. Various habits, such as thumb, finger, lip and tongue sucking, tended to distort the fragile bony tissue which supported the developing dental apparatus. Any influence which tended to interfere with the functional activity of the oral cavity must be considered an etiological factor in dento-facial maldevelopment. Obstructed nasal passages, enlarged tonsils and adenoids were all such factors, and the pediatrician should ever bear these in mind when directing his attention to the welfare of the child's facial development.

Dr. Rogers went on to discuss the histology of bone and showed that the effect of the soft tissues in maintaining the form of the bone might be considerable, and further that the nature of the problems that confronted the orthodontist were fundamentally more orthopedic than dental; perhaps more pediatric, since many of the etiological factors must be searched for during the very early months and years of the child's development.

The purpose of orthodontia Dr. Rogers asserted was not merely the re-establishment of the normal occlusal relations and proper functional activity of the teeth, but also the restoration of the facial contours to those esthetic proportions which nature originally intended should be the heritage of every person. The true conception of the ideals and aims of orthodontia, both as an art and as a science, had been appropriately designated by the title of dento-facial orthopedia. This term signified the restoration of facial symmetry by the correction of abnormal development of the dental arches, of malposition and malrelation of the teeth, and the re-establishment of muscular balance. By the application of the principles of muscle training, and the construction and adjustment of delicately arranged appliances, specially designed to meet the requirements of each case, the necessary mechanical stimuli were supplied to the living cells whose consequent physiological activity would result in the requisite osseous growth carrying the teeth into proper position and relation. From the definition it would be seen that the fundamental principle of the treatment of dento-facial maldevelopment was not so much the alignment of teeth to a given form of arch as it was the development of tissues for the maintenance and support of the dental organs. The tissues concerned were both the hard and soft tissues of the face, and the fundamental and efficient method to be employed in such development was to be found in the early establishment of the functional activity of the parts to such a degree that normal stimuli rendered natural growth more general. In view of these facts it would be recognized how futile was the application of force derived from many forms of apparatus in general use. Continued application of force was not indicated when the natural processes of growth could be employed. The stimulation of cell activity should be painless. For the undertaking of artificial stimulation, most delicate apparatus was necessary, and even then this must be adjusted with the greatest skill and operated with utmost regard for the physiological tissue changes. If the dento-facial orthopedist was skilled, he would augment his mechanical efforts by inducing further and more consistent development of cell activity by increasing the functional activity of the parts. Artificial stimulation should seldom be used without being thus augmented.

The dento-facial orthopedist should, in order to obtain the maximum degree of service, frequently enlist the services of the pediatrician or the family physician. It was easy to appreciate the many ways in which their cooperation might be indispensable to the termination of the case. Malnourished children responded less quickly to treatment than those properly nourished, and the malnourished were found among all classes.

Dr. Rogers gave a summary of the various classifications used by the orthodontist which he thought in a general way should be understood by physicians. Neutrocclusion signified that the dental arches were in their relatively correct anatomical position. Then there was distocclusion or posterocclusion. The third classification was termed mesiocclusion or anterocclusion, in which the mandible took a position anterior to its normal relation. This was typified by an over prominent mandible.

It would be noticed in practically all severe maldevelopments that the muscles of the face and neck, in fact the muscles of the entire body, were to be found in more or less atonic condition. The task of the dento-facial orthopedist was to study and attend to the mechanical requirements of the case and then to apply such corrective measures as were possible through stimulating the activity of the various groups of the facial muscles. Foremost among these groups might be classed the masseter-temporal group. The physician should understand that our problem is one of growth and development, and that our efforts must necessarily cover the child's full period of growth, the periods of treatment being intermittent, the teeth not being held in the grip of any appliance for years at a time. In developing cases, under 13 and 14 years, appliances should be employed for comparatively short periods. The physician might properly use prophylactic measures while the child was under treatment. It should be recognized that only in rare instances did facial muscles distorted through the influences of nasal obstructions, adenoids or enlarged tonsils, become normal without conscious effort. Such children should be given a thorough and well-balanced system of exercises of the various groups of the facial muscles in order to restore them to normal.

In closing, Dr. Rogers discussed the question of nervous irritability in children from the use of dental appliances. He said that such irritability might occur if there was the least carelessness in the adjustment of the apparatus or if unnecessary stress were used. There were several ways in which infection might occur during orthodontic treatment. All these had their origin in the use or adjustment of unsuitable apparatus together with the absence of proper prophylactic measures.

Discussion. DR. ROGER H. DENNETT said it was rather difficult to say which was the most interesting subject to pediatrists, dento-facial maldevelopments or oral sepsis. He thought that perhaps oral sepsis was the more urgent topic, that is, they saw, every day and all day long, the harm that had been done by oral sepsis. Recently a colleague had said to him in conversation that he thought the last decade in medicine the least interesting and that less had been accomplished than for many years in the past. Dr. Dennett had told him that he must not forget that the last 10 years had added to the knowledge of focal infections and if nothing else had been accomplished that, to his mind, was a great deal. We look back upon the time when we thought that oral sepsis did no harm other than to cause digestive disturbances from failure to masticate food properly—and it was not so very long ago. At the present time, we had learned how far-reaching the effects of oral sepsis really were; we hear of them on every hand and see them every day.

Dr. Dennett recalled one of the first cases he had seen many years ago which served to demonstrate the importance of oral sepsis. This patient was a child 4 or 5 years of age who had been running a temperature for a month. The spleen was enlarged but other physical signs were absent, the Widal and Pirquet reactions were negative and the blood and urine gave no clue to the diagnosis. All the laboratory work with which they were acquainted at that time had been done and various specialists had been called in to see the child. The temperature continued to run 100°, 101°, sometimes 102°. The child was so situated that everything could be done for it. Finally somebody discovered that there was a tooth which was the cause of the whole situation. The tooth was treated, the temperature subsided and the enlargement of the spleen disappeared. That all seems simple enough today but that was the first case in his practice in which oral sepsis was determined to be the factor in such a serious condition. We had reached a stage where we were no longer satisfied in simply giving a name to certain disease conditions, but we must find the cause. For instance, the purpuras were formerly classified only according to the degree of the purpura and the anatomical distribution. At the present time, the cause of many purpuras had been found to lie in focal infections, and in many instances in oral sepsis. He recalled a case in a child who had been in the wards on several occasions with a very severe grade of purpura, bleeding profusely and becoming exsanguinated. Each time the purpura was temporarily controlled by transfusion. Finally someone said, "How about that child's teeth?" Cultures were taken and oral sepsis was found to be the cause of the purpura. After the sepsis was eradicated, the purpura never recurred. Those were instances with which pediatricians were now familiar but the fact was that they were curing diseases which were formerly placed as incurable in the text-books and for this we were certainly indebted to the last decade.

There were several topics which the speakers did not have time to touch upon in their papers. One of these was the question of mouth toilet in the acutely sick. One sometimes saw a child with pneumonia in whom the mouth toilet had been neglected during the illness with the result that the chances of recovery were diminished. Again, a child with carious teeth during an acute infection did not have nearly as good a chance of recovery as one whose teeth were in good condition. That point had not been touched upon and it was well worthy of attention.

The pediatrician now examined the mouth of every child, who came under his care, but it had not always been so. Children were always examined from head to foot, stripped, and the pediatrician never neglected the mouth. The teeth were always thoroughly inspected, the contour was noted as well as whether the teeth were carious or poorly kept.

One great difficulty the pediatrician found in overcoming oral sepsis was that of getting dental care. Doctors went to hospitals and dispensaries during their medical course and would work all summer long for the experience they could get. Later as internes in hospitals they spent several years without pay and throughout their career they gave a certain amount of their time to free work in hospitals and dispensaries. The dentists, with a few notable exceptions, were not giving their time as freely as did the doctors and many pediatric clinics were without dental care unless they had money enough to pay a dentist.

DR. LINNAEUS E. LA FÉTRA said that owing to the lateness of the hour he would take very little time because the readers of the papers had covered the ground very satisfactorily. In the matter of oral sepsis the conditions most frequently met with were anemia and malnutrition. The severe types of local conditions in the mouth and severe types of sepsis were seldom met with in the practice of pediatrists, because they were accustomed to examine the mouths of their patients and they were not apt to overlook abscesses or carious teeth. The most common conditions associated with oral sepsis were the secondary anemias, malnutrition and the purpuras to which Dr. Dennett had referred; very severe secondary anemias and even leukemias might arise from the teeth. Where one found spongy gums with severe anemia or leukemia one might expect to find oral sepsis. The prevention of oral sepsis was a part of the duty of pediatrists, and in this he thought they were having very satisfactory cooperation on the part of the dentists.

Whenever he heard Dr. Rogers describe his work he was aghast at the things accomplished by muscle exercise. When in Boston he had seen not only casts and pictures showing the results of this work but he had seen the patients with the pictures taken before they were treated and compared them with the condition of the face and mouth after the excellent training they had received. It was inspiring to know that so many of these deformities could be remedied without cutting operations, and without complicated apparatus. So it gave one a very hopeful feeling to know that we had these new resources in the way of prevention and cure of deformity. One of the speakers had referred to the influence of heredity and environment and it had recalled to his mind the many times he had seen children with maloccluded teeth, poorly developed jaws, enlarged tonsils, adenoids, prolapsed intestines and viscera, etc., and looking at the mothers and fathers and grandmothers and grandfathers he had seen the same type of individual. He thought heredity had a great deal to do with malocclusion and deformity of the teeth and jaw, laxness of ligaments, poor posture, etc. which many of these patients showed. That did not mean, however, that one should take a hopeless attitude because the condition was hereditary for we could change the mode of management and the various factors entering into the environment, and overcome the effects of heredity. By change in the environment, proper food and exercise, the lack of which had probably exaggerated the defects in the parents, these faults in the children might be overcome. In closing, Dr. La Fétra said he felt that our whole attitude should be one of congratulation on the opportunities for cooperation which were now available to pediatrists and dentists.

DR. YOUNG said he agreed so thoroughly with the essayist, that he would only amplify a few points. He said Dr. Rogers misspoke himself when he referred to the early shedding of deciduous teeth. What he wished to imply was the early losing of these deciduous teeth. It is a well recognized fact in the dental profession that teeth in normal occlusion are in best possible relation; it is also a well recognized fact that teeth in normal occlusion are in the best position to be kept clean by function; it is also a well recognized fact that normal occlusion of the teeth is very important to keep the investing tissue of the teeth in healthy relation and it is a generally recognized fact that where teeth are in normal occlusion, the face is found to be in the best balance.

The orthodontist of 20 years ago used appliances sufficiently strong to move the teeth, comparatively speaking, of an elephant. Today he is using appliances as delicate as possible and yet have them remain in place and be stable. The most delicate force conceivable, if constant, will bring about tooth movement. It is not the desire of the modern orthodontist to forcibly move teeth but rather to stimulate cell activity and thus encourage normal growth. It is due to this fact that the essayist has been able to show such tremendous changes by muscle training. So far as he knew, Dr. Young said, there was no one who had done with muscle training what Dr. Rogers had done, it was his hobby, and it was only by enthusiastic belief in the possibilities of this method that one cou'd impress upon the patient the fact that something could be done for him and thus his coöperation could be secured, for without the coöperation of the patient it was all hopeless.

As to the way in which some of these malocclusions came about, the normal place for the tongue to rest with the mouth closed was the roof of the mouth. A child could not live without air, and if it could not get air through the nose, it must get it through the mouth. The air could not be exhaled through the mouth without dropping the tongue, which removes the beneficent results of the muscular force, which tends as a mould for the upper dental arch. At the same moment the opening of the mouth causes a slight tensing of the buccinator muscles which at least prevents normal expansion and may in some cases bring about a narrowing of the upper dental arch with the resultant protrusion of the upper anterior teeth. These things are well recognized by the orthodonist and it is up to the medical men to recognize these same conditions early in life and see to it that correction is undertaken at the proper time.

DR. M. I. SCHAMBERG said there was so much that was interesting in Dr. Rogers' paper and which he was not supposed to discuss that it had taken his mind off the discussion. However, in Dr. Dunning's presentation and in the discussion by his medical confreres he had been impressed by the fact that they were thoroughly alive to the relation between oral sepsis and dental disease, and he thought this was something few of us ever had a chance to forget, so it was unnecessary to emphasize the number of conditions that arose from oral sepsis. In the dental services in hospitals in New York and other large cities throughout the country, the facilities were unquestionably inadequate for handling these cases. While we were constantly hearing of group study in other branches of medicine there had not been that cooperation between the dentist and oral surgeon in institutions which would provide proper care for children's mouths and teeth. It was evident that the vast majority of cases of noma following the exanthemata of childhood, where the child was left in a debilitated condition, might be traced to lack of mouth hygiene. If a child had carious teeth, with sharp broken points that traumatized the tissues, a tremendous infection was apt to occur and ulceration might follow in the form of noma. While much had been said as to the occurrence of noma perhaps the importance of oral sepsis in this connection had not been sufficiently emphasized; it was very apparent that oral sepsis did occur in these neglected cases.

There was another factor in connection with oral sepsis not sufficiently taken into consideration, and that was the fact that in permitting a condition of oral sepsis to exist one was robbing a child of its chances to recover from some other malady, because the vital resistance of the child was definitely lowered by the presence of oral sepsis. Fatal cases were often due to secondary influences. For instance, if a patient had diabetes and tuberculosis, there was slight opportunity for recovery, or if a patient had tuberculosis and a cardiac lesion his chances were very slight, so these infections in the mouth must be cared for in order to give the patient a fighting chance if he should have another malady. In pemphigus a condition was frequently found manifesting itself in the mouth prior to the appearance of other lesions. Dr. Schamberg said that he had several times said a case looked like one of pemphigus and physicians who heard him were shocked and doubted, yet shortly after the typical skin lesions of pemphigus appeared. So in many conditions we must realize that there was an opportunity for infection from the mouth to take place.

Dr. Schamberg emphasized the need of cooperation between all branches of medicine and dentistry, and the fact that in sepsis of the mouth malocclusion was a factor and that one could not expect to find healthy conditions in a mouth where the teeth would not properly close.

Dr. Harold S. Vaughan said that it appeared to him that this was a question for preventive dentistry, and that early attention must be given to the teeth of children. They saw many cases in which caries of the deciduous teeth went on with the later development of an osteomyelitis of the neck or perhaps a lymphadenitis. Dr. Rogers' lantern slides of the developing jaw served to illustrate its liability to bacterial invasion through infected teeth and roots; the unerupted teeth were likely to be involved and persist as areas of infection. Dr. Vaughan emphasized again the importance of corrective work of a preventive nature. He said that New York needed institutions for the early care of children's teeth and wished to say how important it was that these mouths be properly cared for. If an early start were made and children were taught to use the tooth brush and have small cavities attended to, the serious conditions spoken of would not occur. In his work he saw many cases of cellulitis of the neck and osteomyelitis that would be prevented by early dental treatment. The thing that appealed to him most in connection with Dr. Roger's methods was that they stimulated bone growth through muscular effort, and later by the gradual stimulation of delicate appliances, thus avoiding the nervous shock attendant upon the prolonged use of older types of appliances. In this he thought the orthodontist had made a very positive advance.

BOOK REVIEWS

Nutrition and Growth in Children. By William R. P. Emerson, A. B., M. D., Professor of Pediatrics, Tufts College Medical School; President, Nutrition Clinics for Delicate Children. Incorporated: Medical Adviser, Elizabeth McCormick Memorial Fund, Chicago; Visiting Physician (in charge of Nutrition Clinic), Children's Out-Patient Department, Massachusetts General Hospital, Boston. Illustrated. New York and London. D. Appleton and Company, 1922.

Doctor Emerson has come to be regarded as the authority on nutrition and growth in this country. He has done pioneer work on the subject and organized in 1908 the first nutrition class. At that time malnutrition was almost invariably considered to be a problem of poverty and food. It quickly became apparent that these were not the only factors. Accordingly, during the past 13 years, Doctor Emerson has been working on the problem and this book is the result of his investigations. For many years children were only examined when they were sick. Now it is becoming more and more evident that to have normal children intelligent care of them while well is essential. For this reason this carefully thought out book is regarded by the reviewer as being one of the most important books of its kind to appear in years. It is a book that should be used as a text-book in medical schools, and should be used by all modern hospitals which are interested in special nutritional care of the child. H. R. M.

The Care and Feeding of Southern Babies. A guide for Mothers, Nurses and Baby Welfare Workers of the South. By Owen H. Wilson, M.D., Professor of Diseases of Children, Vanderbilt University. Nashville, Tennessee. Baird-Ward Printing Company, Publishers, 1920.

This small primer on the care and feeding of southern babies is simply another in the long list of guides to helpless mothers. It has all been done before, and done well. It adds absolutely nothing to our pediatric knowledge, although concisely written. It comprises 129 pages and an index. H. R. M.

PRACTICAL INFANT FEEDING. By LEWIS WEBB HILL, M.D., Junior, Assistant Physician to the Children's Hospital, Boston; Assistant in Pediatrics, Harvard Medical School. Illustrated. Philadelphia and London. W. B. Saunders Company, 1922.

In this book we have a real contribution to the science, or rather, the art of infant feeding. It is a thoughtful book presented in a clear, logical manner without any extraneous matter which might tend to obscure the main topic. There have been so many books written on infant feeding that it is hard for an author to deviate from the cut and dried path enough to make the book individual or even necessary. In our opinion Doctor Hill has done this in that he has combined his own personal experience with the supplemental experience of men working in the same field reported in the current literature. He has also been successful in his endeavor to be practical without being superficial, scientific without being tiresome. We recommend it as a well worth while book, especially for post-graduate students. H. R. M.

THE CLINICAL STUDY AND TREATMENT OF SICK CHILDREN. By JOHN THOMSON, M.D., F.R.C.P. Ed.; Hon. Member of the AmericanPediatric Society; Consulting Physician to the Royal Edinburgh Hospital for Sick Children; formerly Clinical Lecturer on the Diseases of Children, University of Edinburgh. Third edition, re-written and greatly enlarged. With 249 illustrations. Edinburgh and London. Oliver and Boyd, 1921.

This British classic is a book written by an eminent clinician for clinicians. This third edition presents a very thorough digest of current medical literature on diseases of children. Doctor Thomson marks a new departure in medical literature by his plan of combining instruction in clinical methods of examination with his descriptions of diseases themselves. This, plus the many illustrations, makes it a book peculiarly suited to the general practitioner both in England and in this country. There has been added too in this edition a new chapter on the food disorders of infancy. Also the chapters on infant feeding, rickets, diseases of the liver, and skin diseases have been greatly amplified, to mention a few of the changes. There are new chapters on acetonemia, and pyrexia, and a wealth of new material has been added to the sections on functional nervous disorders. Treatment is especially stressed and the bibliography is complete and concise. In it he covers the field thoroughly, neglecting little which has appeared in later years in American, British and Continental literature. As a book of reference and for teaching purposes it can hardly be bettered.

H.R.M.

INFANT FEEDING. By CLIFFORD G. GRULEE, A.M., M.D., LL.D., Associate Professor and Acting Head of the Department of Pediatrics, Rush Medical College; Chief of Pediatric Staff, Presbyterian Hospital; Consulting Pediatrician, Provident Hospital and the Home for Destitute Crippled Children; Lecturer on Child Hygiene, University of Chicago. Fourth edition, thoroughly revised. Philadelphia and London. W. B. Saunders Company, 1922.

Doctor Grulee's fourth edition should be as well received as his preceding three. The book comprises a complete summary of the pediatric literature up to April 1921, and it successfully correlates these facts with those that have gone before. At the same time he has not made the book encyclopedic, inasmuch as much dead wood has been pruned away. The book is still based upon Professor Grulee's lectures to his students at the Rush Medical School. At the same time, it can be used with profit by the general practitioner who is desirous of examining and treating scientifically his childrens' practice. We feel sure that it will grow in popularity. H.R.M.

LE DISPENSAIRE MARIN, UN ORGANISME NOUVEAU DE PUÉRICULTURE, par le DR. J. JARRICOT. 1 volume grand in-8° de 628 pages avec 144 figures et 54 planches hors texte. Prix, 60 fr. net. Paris, Masson et C^{ie}, 1922.

This is a weighty volume in more than one sense, namely, it is printed on thick paper and being of 628 pages its size and weight are considerable; furthermore, the text is rather involved so as to make heavy reading. With the introductory chapters one must agree, in that there have been too few laws made, and precautions taken, for the prevention of infantile mortality. As the author says, laws are continually being made for the protection of the aged, and of the workman at his work, and practically nothing is being done to cut down the toll of mortality in the first year of life, which in France runs up to 80,000 per year There are several statements in the book, however, which cannot be at once accepted with the enthusiasm shown by Jarricot. The first is that sea water is almost a panacea for all the ills to which the infant is subject, and the second is the employment of the so-called *"regime of instinct,"* where the child is allowed to set his own limit on the amount of milk and water which he ingests daily. Isotonic sea water is considered, from a mineral standpoint, as a culture medium for the organic cell, and like all mineral waters, radioactive. The quantity of liquid secreted by the kidney and the amount of solid material excreted by that organ, is double under sea water injections what it is under simple normal saline injections. Sea water may be given by mouth, by rectum (Wassermann's method) or under the skin, the last method being the one of choice. These injections fix water in the tissues of the infant, cause a change in the facies in 2 hours in cases of severe dehydration, and cause a startling immediate gain in weight. The *"regime of instinct"* is not followed by the author in certain cases as (1) choleriform enteritis, (2) hernia, (3) excessive or normal weight for height, (4) hot weather. The term *"dispensaire marin"* is a hard one to translate, as *"marine dispensary"* does not convey the essential idea that this is an institution at the seashore where children are treated, for a multitude of conditions, by dietetic measures, and injections of sea water. Certainly from the photographs and charts of children treated therein, there is something to the methods used. One quite naturally wonders just how much the sea water injections are really to be given credit for the results obtained, and how much depends on careful physical examination, high caloric feeding, and close observation. It will be interesting to watch and see whether the somewhat dazzling statistical results set forth by Jarricot will be the means of spreading far and wide the gospel of *"sea water injections."* W. H. D.

OUTLINES OF PHYSICAL DIAGNOSIS OF THE CIRCULATORY AND RESPIRATORY SYSTEMS. Prepared from the lectures of THOMAS BARNES FUTCHER, M.B., Associate Professor of Clinical Medicine, the Johns Hopkins University Medical School by JOHN GARDNER MURRAY, JR. Second Edition. Baltimore. The Students' Book Store, 1920.

While primarily a book for medical students, this book can be used by the practitioner in rapidly reviewing the salient facts of the physical diagnosis of the following diseases: pericarditis, chronic valvular disease, congenital heart lesions, aneurisms, bronchiectasis, lobar pneumonia, bronchopneumonia, tuberculosis, pleurisy, and pneumothorax. In addition, the book contains definite rules in regard to taking the history, and making the examination which might be followed out to advantage by one who has gotten beyond the status of the medical student. These small pocket editions are always of interest and value.

Leitfaden der Kinderheilkunde für Studierende und Ärzte von Dr. Walter Birk. Erster Teil: Säuglingskrankheiten, Vierte, verbesserte Auflage. Bonn, A. Marcus & Webers Verlag, 1920. Preis Marks 18.20.

The present edition follows closely previous editions and will be welcome to those interested in the continental method of presenting these subjects particularly infant feeding. The style is clear and concise and the author successfully resists the temptation to lose himself in theoretical considerations. In the classification of nutritional diseases, Birk follows Czerny and Keller and at the same time takes cognizance of the views of Finkelstein. It would be out of place here to discuss so controversial a question as classification. It seems that American writers have refused to follow the German lead in this regard and one wonders whether Czerny's classification, helpful as it once may have been, has not outgrown its usefulness. In general this arrangement forces certain conditions into the classification at the expense of accuracy. Thus, scurvy is considered a nutritional disturbance "exalimentatione," and a scant paragraph, in small type, is devoted to vitamins. Again, intestinal intoxication is considered under disturbances "exinfectione," although Finkelstein's views are referred to. Finally, under neuropathic diathesis, one finds pylorospasm, and rickets is regarded as a disorder "exconstitione." In a word, the classification is systematic and orderly but does not accord with observations and views which, if not correct, are at least accepted as correct in America. In spite of this, the book is very helpful. Symptoms and diagnostic signs are outlined clearly and advice concerning treatment is sound. The reader receives the impression that he is conferring with an excellent physician whose counsel is worth while.

THE ENDOCRINES. BY SAMUEL WYLLIS BANDLER, A.B., M.D., F.A.C.S., Professor of Gynecology in the New York Post-Graduate Medical School and Hospital. Philadelphia and London. W. B. Saunders Co., 1920.

Although a book primarily written for the obstetrician and the gynecologist, yet it can well be read and absorbed by the pediatrist, if only for the chapters on environment and heredity; an introduction to the story of the endocrines; and internal secretions. In particular, the chapter on environment and heredity presents the psychology of early childhood in a most refreshing way and is a chapter which should be analyzed carefully. Dr. Bandler satisfies one's mind in his explanation to the child of the arrival of the stork, and the curiosity manifested by the child in regard to childbirth. A wholesome explanation has been given; one that is perfectly true and correct, and no suggestion has been put in the child's mind that the question involves anything which she has not a right to know or to understand. For the gynecologist, the book covers the subject thoroughly and is made especially applicable because of the 120 pages of clinics and cases appended. It is an interesting book on an interesting subject.

THYMUS DEATH (Pediatria, Naples, March 15, 1922). Battino reports the death of two children in one family for which nothing but the extra large thymus could be incriminated. .The parents were asthenic and closely related, and there had been several abortions. The boy of 4 died suddenly during the night. The girl of 6 had eaten heartily at noon and again an hour or two later. Walking home, she fell suddenly lifeless, without laryngospasm or cyanosis of the face. Comparison with similar cases on record suggests that exaggerated gastrointestinal pressure on the diaphragm may entail congestion in the thymus, and the nerves in the thymus may by reflex action arrest the heart. Mouriquand has reported a case in which treatment as for syphilis was followed by return of the thymus to normal size.—*Journal A. M. A.*

449.

ARCHIVES OF PEDIATRICS

AUGUST, 1922

HARROLD RUCKMAN MIXSELL, A.B., M.D., Editor

COLLABORATORS:

Rowland G. Freeman, M.D...New York
W. P. Northrup, M.D........New York
Henry D. Chapin, M.D......New York
Francis Huber, M.D..........New York
Henry Koplik, M.D.........New York
Walter Lester Carr, M.D....New York
C. G. Kerley, M.D...........New York
L. E. La Fétra, M.D.........New York
Royal Storrs Haynes, M.D...New York
Herbert B. Wilcox, M.D.....New York
Charles Herrman, M.D......New York
Wm. Henry Donnelly, M.D...Brooklyn
Frank H. Richardson, M.D....Brooklyn
Edwin E. Graham, M.D.....Philadelphia
J. P. Crozer Griffith, M.D..Philadelphia
J. C. Gittings, M.D.........Philadelphia
A. Graeme Mitchell, M.D..Philadelphia
Charles A. Fife, M.D.......Philadelphia
H. C. Carpenter, M.D.......Philadelphia
I. A. Abt, M.D.................Chicago
William P. Lucas, M.D...San Francisco
R. Langley Porter, M.D...San Francisco
E. C. Fleischner, M.D.....San Francisco
Oscar M. Schloss, M.D..........Boston
Maynard Ladd, M.D.............Boston
Charles Hunter Dunn, M.D.....Boston
Henry I. Bowditch, M.D.........Boston
Richard M. Smith, M.D.........Boston
L. R. De Buys, M.D.......New Orleans
Robert A. Strong, M.D.....New Orleans
John Foote, M.D............Washington
Joseph S. Wall, M.D.......Washington
B. K. Rachford, M.D.........Cincinnati
Henry J. Gerstenberger, M.D..Cleveland
Borden S. Veeder, M.D........St. Louis
Frederick W. Schlutz, M.D.Minneapolis
Julius P. Sedgwick, M.D...Minneapolis
William Weston, Jr., M.D..Columbia, S.C
A. D. Blackader, M.D.........Montreal
Edmund Cautley, M.D..........London
G. A. Sutherland, M.D........London
J. D. Rolleston, M.D...........London
J. W. Ballantyne, M.D.......Edinburgh
James Carmichael, M.D.......Edinburgh
G. A. Wright, M.D.........Manchester

PUBLISHED MONTHLY BY E. B. TREAT & CO., 45 EAST 17TH STREET, NEW YORK.

ORIGINAL COMMUNICATIONS

PROGNOSIS AND TREATMENT OF TUBERCULOSIS IN INFANCY AND CHILDHOOD.*

By Rowland G. Freeman, M.D.,

New York.

Inasmuch as little has been contributed to medical literature on tuberculosis in infancy and early childhood, and tuberculosis of the lung in early life is considered a difficult condition to treat satisfactorily, it has seemed to me that a discussion of the subject, with some illustrative cases, might be of advantage.

My first knowledge of the tuberculosis of infancy was gained as a pathologist, and later as attending physician, at the New York Foundling Hospital. I learned there that a tuberculous meningitis in infancy is usually a terminal lesion in a general tuberculosis, and that tuberculosis in infancy is characterized by an early involvement of the bronchial lymph nodes. This led Northrup to believe that most tuberculosis is respiratory in origin, but I found a number of cases of evident intestinal tuberculosis. I was particularly interested in tuberculosis from tubercle bacilli in milk, and felt convinced that a good deal of tuberculosis was of alimentary origin, particularly in view of the fact that in lower animals, no matter where the tubercle bacilli are introduced, the bronchial lymph nodes are very early involved.

---

* Read before the Thirty-fourth Annual Meeting of the American Pediatric Society, held at Washington, D. C., May 1, 2 and 3, 1922.

The demonstration by Theobald Smith of the cultural characteristics and the possibility of differentiating bovine from human bacilli led a way for Park and others to identify the lesion in children as of bovine or human origin. More than 1,000 cases have been run through for this differentiation and we have learned that about one-third of the cases of tuberculosis in children are of bovine origin. Cases of intestinal tuberculosis and of tuberculosis of the cervical lymph nodes are particularly apt to be of bovine origin.

Tuberculosis in infancy and childhood in private practice, among intelligent people, is more apt to be bovine in origin than human, because the danger of tuberculosis in man is recognized and such contact is generally avoided. Milk, however, which is a frequent carrier of bovine tubercle bacilli, is still used either raw or commercially pasteurized on the advice of many physicians. They assume that what we call clean milk is really clean and free from harmful bacteria, and also that commercially pasteurized milk is a fairly sterile fluid. As a matter of fact, certified milk, which is our cleanest milk, contains usually some 300 bacteria in a drop and commercially pasteurized milk usually over 2,000 bacteria per drop. On the other hand, people living in crowded tenements cannot so well isolate their cases of tuberculosis, even if so advised, and thus our hospital cases in children are apt to be of human origin.

That tuberculosis may develop in fetal life is now well established. I have, myself, made autopsies soon after birth on infants with tuberculous lesions that could scarcely have developed after birth. Whitman-Green (Archives of Internal Medicine, February 15, 1922, Vol. 29, No. 2, p. 261-274) have reviewed the literature and in a careful analysis of the cases believe that there are 113 reported authentic cases, while there are 519 cases which they consider doubtful.

I think it is true in tuberculosis that the younger the child the less resistance it has to the tubercle bacillus. It seems unlikely that the immunity an infant, in the first months of life, has for some diseases, exists also for tuberculosis.

It is true of the lower animals, as well as for man, that the tubercle bacillus, no matter where the portal of entry, usually soon lodges in the bronchial lymph nodes and from there rapidly spreads to the lungs, liver, spleen, kidney and meninges.

The prognosis in these cases, in the first year after the involvement of the lung, is absolutely bad. In certain cases, a temporary amelioration may sometimes, though rarely, be obtained. On the other hand, infection of the cervical lymph nodes during the first year, may not spread, after the removal of the very large nodes. Children with this trouble, under proper conditions, may go on to good health.

Tuberculosis is usually so acute a disease in the first year that the cases are rarely emaciated at the time of death. The children with chronic lung lesions, who die in the first year in an emaciated condition, are more likely to have an unresolved pneumonia than a tuberculosis.

It is characteristic of the tuberculosis of early life that it may cause considerable temperature with little leucocytosis or increased polynuclear count. There is very little emaciation and the lesion is more likely to be in the lower lobes of the lungs than in the apices.

In some cases, where identification of tuberculosis by an x-ray plate is impossible, an extensive involvement of the lymph nodes may be shown, if the plate, instead of being taken in an antero-posterior position, is taken at an oblique angle. By this method the shadows of enlarged bronchial lymph nodes are thrown to one side of the vertebral column.

In one case, where the bronchial lymph nodes were well shown, the D'Espine's sign of transmitted whisper was heard to the level of the ninth rib, and in another case, to that of the eighth rib.

The results obtained in the cases related are due, I believe, to the thorough use of the following curative agents in the order of their comparative value.

First. Fresh, out-of-door, moving air, cold if possible. The value of this agent is generally conceded, but too few cases are kept in this sort f air 24 hours in each day. Prof. Leonard Hill reports that the Department of Applied Physiology of the Medical Research Council in England found that the metabolism of children exposed to the air was nearly 40 per cent. above that of children in a room.

Second. Heliotherapy. This is a valuable agent in tuberculosis of the lungs in children in this country. In a limited experience I have seen no bad results from its use. In visiting Rollier's sanitarium at Leysin, Switzerland, last summer, I learned that they considered it a rather dangerous agent in lung tuberculosis. They used it but thought it should be employed with caution. In Leysin, at an altitude of 4,000 feet, with usually a clear sky, the sun's rays are much more active than in New York as evidenced by the fact that they do not expose any case more than 3 hours a day to the sun, and are very careful to shield the eyes.

In the article by Prof. Leonard Hill, referred to before, he states that Dr. Sonne, of the Finston Light Institute, compared sunlight with dark heat. He found that 3 times as much sunlight as dark heat was required to burn the skin, this deing due to the fact that the visible rays penetrate the skin and are absorbed by the circulating blood. He found that sunlight heats the blood under the skin 5 degrees centigrade above dark heat, when each is used to a just endurable degree. This absorption of heat has a profound effect on immunity to disease. It is the visible, not the ultra violet, rays that stimulate health. Pigmentation is a protection against the visible rays, and improvement is proportional to the amount of pigmentation.

Third. Cod-liver oil. This is, I think, a useful agent, if it is well tolerated as it is usually.

Fourth. A full diet is essential, and complete rest is necessary for a long period.

The following are cases of localized tuberculosis in the first year that have never gone on to tuberculosis elsewhere:—

T. C., born, June 27, 1913, was a first baby; induced labor. Had a severe attack during the first week, when he became blue. Birth weight 6 pounds 10 ounces. Child showed weakness of right leg and right arm. Was fed by a wet nurse, but was given one bottle of raw milk each day up to the time I saw him at 4 months old. Then had slight snuffles, but did fairly well until he was 5 months old when he weighed 13 pounds 10 ounces, and developed a cardiac murmur which, however, was of a transitory character. At the same time he had a severe cold with profuse nasal discharge. The nasal obstruction that ensued persisted and 3 months later a large adenoid was removed. At this time the cervical lymph nodes were large and the enlargement grew constantly worse, involving both sides of the neck. The child showed a positive von Pirquet on the fifteenth of April and on the seventeenth an operation was resorted to for the removal of these lymph nodes. The involvement was so extensive that it was impossible to remove all the tuberculous lymph nodes. The wound healed slowly and the child was sent out of town immediately where heliotherapy was applied and he was kept out-of-doors constantly.

After the operation he gained weight rapidly. At eighteen months, he weighed 21½ pounds, a gain of 8 pounds in 8 months from the time of the operation.

This boy was kept in the country all winter, and was given sun baths and plenty of fresh air. In the summer, he was at the sea-shore playing in an abbreviated bathing suit. He has gone on, for the last 8 years since the operation, making uninterrupted progress, and has never had any tuberculous manifestation since. He has never been robust. The weakness of the right side is becoming gradually less evident. His general nutrition is good.

Another case of localized tuberculosis in the first year occurred in Baby G., born October 30, 1915. This child was in an apartment where the sun never entered but did very well until she was 2 months old when, while still gaining well and looking well, an abundant, offensive discharge appeared in the left ear, without fever and without evidence of pain. The child was referred to a specialist for local treatment who complained that he could not see the ear well. The discharge continued under his care for 4 months when the child was sent for consultation to another ear specialist who reported that an immediate mastoid operation must be done. A von Pirquet test was markedly positive. The operation showed an absolutely destroyed middle ear with extensive mastoid involvement, and a radical mastoid operation was performed.

The child went along fairly well after this for 2 months when the lymph nodes on the left side of the neck became enlarged. They were removed by Dr. Dowd, and some of them were sent to the Board of Health for differentiation, and the organism was found to be of the bovine type.

Thus in the first year, this child had not only a tuberculous infection of the ear, but an extensive involvement of the cervical lymph nodes.

Following this she was given sun baths, fresh air, and cod-liver oil, and gained rapidly from 14¼ pounds at 7 months to 22½ pounds at 17 months, a gain of 8 pounds in 10 months.

This child is now 6½ years old. She measures 47½ inches and weighs 51½ pounds, so that she is up to the general average of nearly 8 years in height and of normal weight for her height. She has been as well as any other child who has not had this experience.

Another interesting case of localized tuberculosis in the first year occurred in the child D. K., who was born November 4, 1914. She did fairly well, although living in an apartment without sunlight, until about 8 months of age, when an ulcer, which was fairly large, appeared on the lower lip. The glands under the chin became enlarged and also another one over the right parotid in front of the ear.

A specific lesion was suspected, but a diagnosis of tuberculosis was finally made because the gland in front of the ear suppurated freely, and the child had a markedly positive von Pirquet, and a negative Wassermann. It was found that the family had employed as cook an emaciated woman with persistent cough who had repeatedly kissed the baby on her lips. The glands disappeared after suppuration and the ulcer healed after cauterization. She is now nearly 8 years old, has developed well and has had no other tuberculous trouble

One of the most remarkable recoveries from tuberculosis was in a boy who did well until he was 1½ years old, when he had some enlargement of the cervical lymph nodes on both sides of the neck. This lasted about 10 weeks, during which time he had also a marked leucocytosis. An adenoid was removed and the boy did well until the following June when he had a moderate attack of measles. On the eighth day the temperature came down to 99½°, the next day it was nearly 101°, the following day 104°

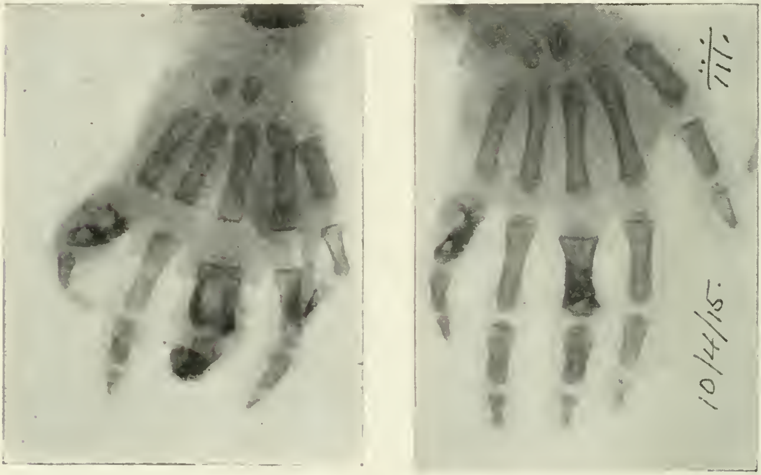
and the day after that 105°. This was accompanied by marked remissions. At the same time he developed signs at the left base where there was dullness, diminished breathing, and signs making one suspicious of fluid. Repeated attempts to aspirate the chest with the needle gave negative results and it was evident that the boy had neither fluid nor pneumonia but an active tuberculosis.

It became very hot in New York in July and although the boy's temperature was rising to 105° at night and down to nearly normal in the morning, he was sent by boat to the most eastern part of Maine where he remained all summer, living outdoors all the time, with a physician in attendance.

Gradually the rise of temperature became a little more moderate so that by the end of July it was not exceeding 103°. The following November, he was brought back to New York and was placed out of town where he could live out-of-doors. At this time he was running a temperature of 101°-101½° at night, the fingers and toes were markedly clubbed, there was dullness, diminished breathing and sibilant rales over the whole of the left chest, bronchial breathing over an area 2½ inches from the root of the left lung, and some signs at the root of the right lung. His sputum was positive to tubercle bacilli. He had slight enlargement of the cervical lymph nodes. He was markedly emaciated. He was not using his legs. With the reduction in temperature he began to gain weight rapidly, increasing from 31 pounds, on the second of December, to 44 pounds on the twentieth of the following May. The signs in the chest gradually disappeared, the temperature became normal at the end of one year. At the end of 2 years, he had a discharging ear which was diagnosed as tuberculous and which persisted for another year.

This boy went on from that time to an absolutely normal development. He was kept out of doors and not sent to school until he was 12 years of age. He has somewhat impaired hearing in his right ear. At 14 years of age, he measured 61½ inches and weighed 107 pounds. He has red cheeks, is stout, well developed and noticeably robust in appearance.

The effect of appropriate treatment in local tuberculous lesions in infancy and early childhood may be illustrated by the following case: a child with a tuberculous dactylitis involving the middle and fourth fingers was treated by fresh air, sun baths and cod-liver oil, intermittently for one year. A very marked improvement in the lesion was shown by the closure of the sinuses, and the subsidence of the swelling, although the child was for considerable periods during this time, out of observation and without treatment. Fig. 1, shows the fingers when treatment was begun, and Fig. 2, one year later.



FIGS. 1 and 2.—Radiographs of case of tuberculous dactylitis, before and after treatment.

An interesting evidence of the rapid spread of miliary tuberculosis in infancy is shown in the following case, where the x-ray plate taken 2 months after admission showed a normal lung shadow, 20 days later, a marked miliary infection, and 13 days after that, just before death, a considerable advance in the process.

The history of this case is as follows: an infant, S. N., was admitted as a boarder. His mother had advanced pulmonary tuberculosis. The blood showed 11,000 white cells and 55 per cent. polynuclears. An intradermal tuberculin test was positive. The spinal fluid contained 6 cells. After being in the hospital for 2 months, the child began to run a temperature. The blood count increased slightly to 16,000 white cells, with 50 per cent. polynuclears. He developed Kernig's sign and a Brudzinski, with rigidity of the neck. The temperature gradually increased. There was no loss in weight, but he finally died 3 months after admission.

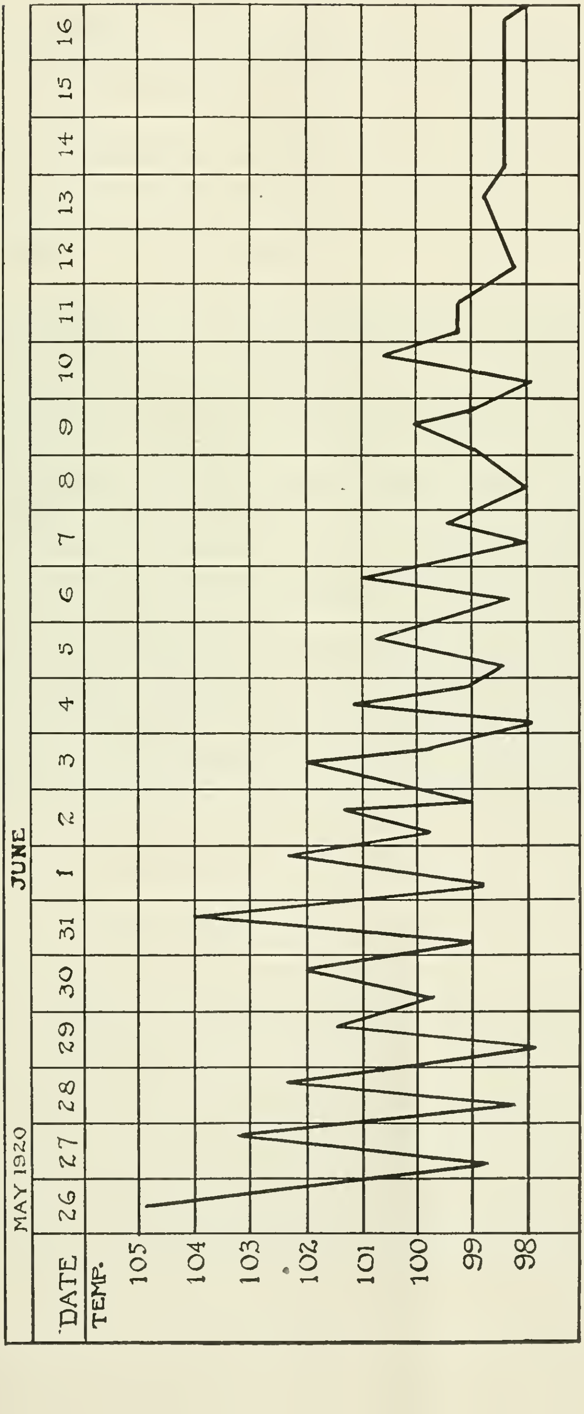


Fig. 3.—Temperature chart of case of tuberculosis of lungs. (J. B.)

The autopsy showed a generalized tuberculosis involving the lungs, liver, spleen, kidneys and heart; the head was not opened. His length was 21 inches.

An Italian boy, J. B., 2 years old, came in with a history of fever, cough and dyspnea for 2 days. There was no family history of tuberculosis. The von Pirquet test was negative and a diagnosis was made from the x-ray plate. The blood count showed 30,000 white cells and 84 per cent. polynuclear leucocytes. The urine showed a marked acidosis and indicanuria. He was put on the roof and given fresh air and sun baths. At the end of 10 days, his temperature had reached normal and remained practically normal from that time (Fig. 3). After an initial loss in weight, he gained steadily (Fig. 4), and was discharged practically cured. The x-ray picture of his chest on admission (Fig. 5) showed a miliary involvement which obliterated the heart outline, while that taken at the time of discharge is shown in Fig. 6.

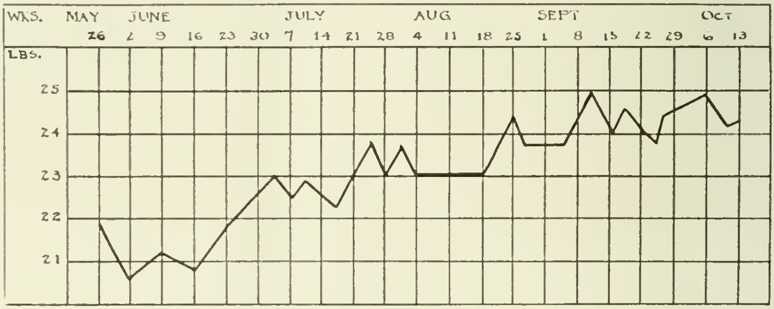
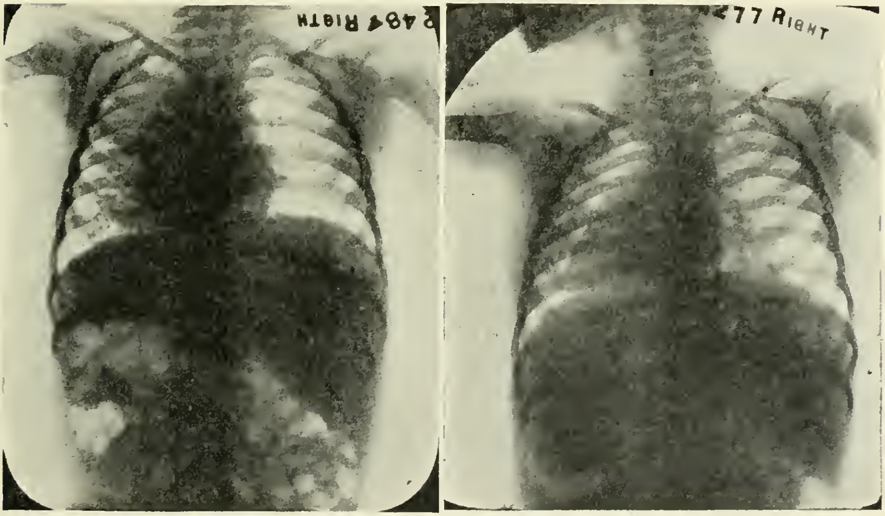


FIG. 4.—Weight chart of case of tuberculosis of lungs. (J. B.)

E. C., a negro child, 2 years old, came in with a history of cough and fever for 6 weeks. The child was well nourished, there was no dyspnea. Physical examination showed an area of impaired resonance with bronchial and bronchovesicular breathing and creptitant rales. The cervical lymph nodes were somewhat enlarged. She had a large abdomen with an umbilical hernia large enough to admit the tips of 3 fingers. A diagnosis of bronchopneumonia was made. The signs in the chest improved. A month after admission, on account of dullness in the left axilla, a needle was inserted but no fluid was obtained. I saw her first 2½ months after admission and found diminished breathing and crepitant rales all over the back, without impairment of resonance; signs which I considered suspicious of miliary tuberculosis. The von Pirquet test was positive. The blood showed 15,000 white cells and 55 per cent. polynuclears, which at one time increased to 86 per cent. After 2 months, she began to gain in weight, her temperature became practically normal 3½ months after admission, and she was finally discharged 7½ months after admission with chicken-pox. Her x-ray plate at that time showed a marked clearing of the original involvement of the left lower lobe, although there was still some shadow there as well as over the left upper lobe.



FIGS. 5 and 6.—Radiographs of case of tuberculosis of lungs, (J. B.), before and after treatment.

T. B., 7 years old, came to the clinic at the medical school on 2 successive Tuesdays with a temperature of 102½°. She was said to have had a cough for almost a year and had lost weight during the previous month. On physical examination, there was some emaciation. At the right apex in front there was dullness on percussion and bronchial breathing, and in the right axilla were a few dry rales on inspiration. The left apex was dull, there was amphoric breathing and coarse rales over the entire apex and axilla. The liver was not enlarged, the spleen was palpable. She was sent

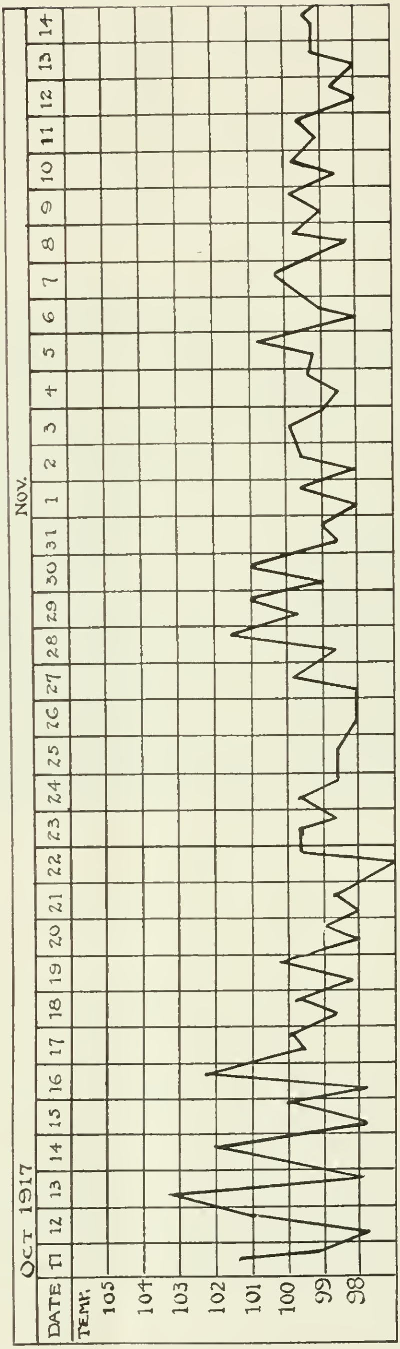


FIG. 7.—Temperature chart of case of tuberculosis of lungs. (T. B.)

to the Roosevelt Hospital where she was kept on the roof and given sun-baths each day. Her blood count showed 37,000 white cells and 78 per cent. polynuclears. She had a positive von Pirquet test. Her temperature reached normal within a week (Fig. 7). She soon began to gain weight rapidly (Fig. 8), and gradually the signs in the chest cleared, excepting for a cavity at the left apex. Fig. 9 shows the x-ray picture of her chest on admission with a marked shadow over the whole left thorax, while Fig. 10 shows an x-ray of her chest 8 months later, before discharge, with the cavity in the left apex and induration surrounding it, but no other evident involvement.

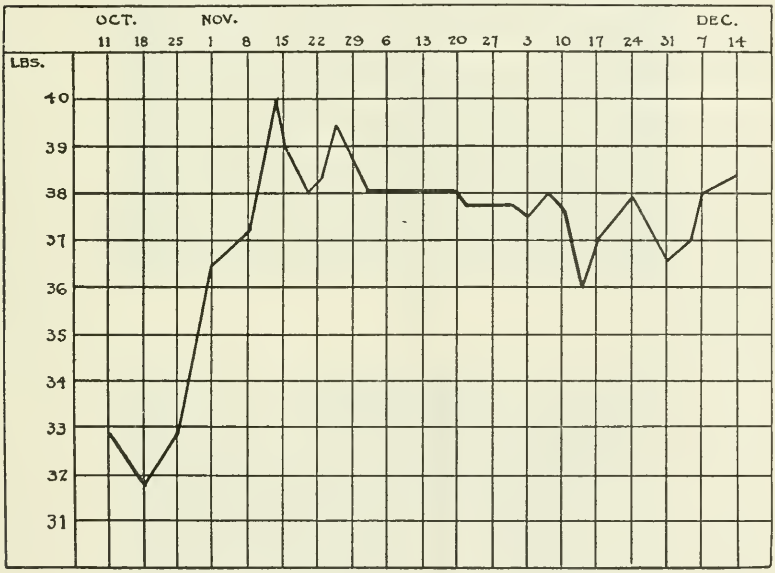


Fig. 8.—Weight chart of case of tuberculosis of lungs. (T. B.)

She remained in the hospital from October until the following July. At this time she was fairly well nourished, had a good color, and no evidence of tuberculosis in her chest excepting the old cavity. She did well during the summer, but in the autumn there was a severe epidemic of influenza with which she was seized and from which she died.

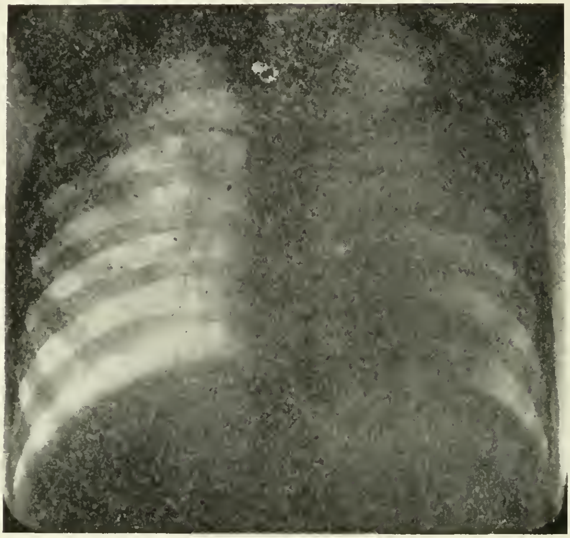


FIG. 9.

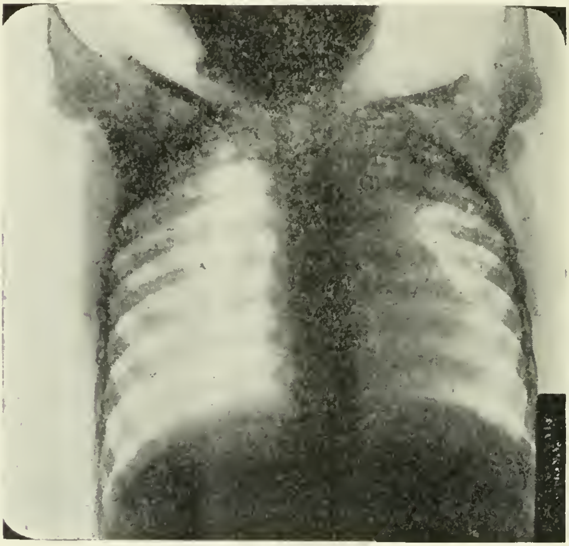


FIG. 10.

Radiographs of case of tuberculosis of lungs, (T. B.), before and after treatment.

CONCLUSIONS.

1. Tuberculosis in infancy, which is localized, may often be cured by prompt interference and thorough treatment. If, however, it has involved the lungs, it rapidly becomes a generalized tuberculosis and gives an absolutely bad prognosis.

2. Tuberculosis in either infancy or early childhood, whether rapidly progressing or slow in its progress, causes comparatively little emaciation. If an infant or young child with a chronic lung condition emaciates rapidly the probability is that the condition is not tuberculous.

3. Enlarged bronchial lymph nodes, when present, may be shown with the x-ray plate if the picture is taken in a lateral oblique angle instead of in anteroposterior position.

4. Tuberculosis of the lungs in children over 1 or 2 years of age may, in many cases, be cured if prompt action is taken; if fresh air is used persistently; heliotherapy, cautiously; and rest, full nourishing and digestive diet, and cod-liver oil are given. These children, if destined to do well, rapidly lose their temperature, and soon gain weight, while the physical signs and the x-ray pictures of the chest will more gradually show improvement.

211 *W. 57th Street.*

INTESTINAL NEUROSES IN INFANTS (Jahrbuch für Kinderheilkunde, Berlin, May, 1922). Stargardter reports the cases of three breast fed and apparently normal infants who developed diarrhea, flatulence and colic for which no explanation could be found in the food or infection. Formed stools appeared after four or five daily intramuscular injections of epinephrin, and the cure was complete by the eighth or tenth day in 2 of the infants; the other child had several relapses. Probably intercurrent infections were responsible for this. The benefit from epinephrin seems to stamp the dyspepsia in such cases as a sympatheticotonic neurosis, if all other causes can be excluded and dietetic measures fail to relieve. These children showed no signs that suggested the exudative diathesis, and after discovery did not display any tendency to nervousness. —*Journal A. M. A.*

THE HEART ACTION IN SPASMOPHILIA.*

(*Latent tetany, tetanoid states, manifest tetany*)

By Henry Koplik, M.D.,

New York.

Spasmophilia, a descriptive term first suggested by Soltman, and introduced into our permanent nomenclature by Heubner and Finkelstein, is a condition of increased galvanic and mechanical irritability of the peripheral nervous system. It is characterized by certain clonic and tonic spasms of local muscles and generalized convulsions. The great master, Escherich, in his epoch-making monograph upon "Tetany in Children," classes these cases as tetany. Infants and children up to the age of 3 years, in whom there is an increased tendency to convulsions, with a pathological increased irritability of the motor sensitive and vegetative nervous system, and an increased irritability of the peripheral nerves, are designated as latent tetany. This pathologic increased irritability is the foundation on which may develop the multitudinous symptoms of manifest tetany. The condition of latent tetany shades into that of the tetanoid state, and this suddenly, in many instances without any warning, into manifest tetany. In this manner, as I conceive it, can we reconcile the discussion as to whether spasmophilia is a ground for the development of the tetanoid condition, laryngospasm, carpopedal spasm, with or without convulsions.

With this introductory note I wish to indicate the conditions in which I have clinically studied the heart action in spasmophilia (tetany). Under this term I would include laryngeal stridor, apnea in its various forms, laryngospasm with or without carpopedal spasm, apnea without laryngospasm, convulsions, and, finally, manifest tetany. In approaching the subject I am cognizant that in the literature the classification which I have just indicated is confused in the minds of earlier authors, inasmuch as some, Soltman, Baginsky, even Thiemisch, would not include all cases of laryngospasm or convulsions under the heading of tetany. I have, therefore, in my observations excluded all cases of convulsions due to other causes and confined my attention only to those cases of spasmophilia in which there is an increased irritability to the galvanic current of the peripheral nerves according to a very characteristic formula laid down by Thiemisch and especially von Pirquet, in which the kathodal opening contracture and the anodal opening and closing contractures are certainly below 5 milliamperes and in most cases below 2.5 milliamperes, and in a great many cases 1 milliampere. All reactions were taken on the ulnar nerves or radial branches without anesthesia. In the latent cases of tetany, the reactions were well illustrated in the interval between convulsions or between attacks of apnea or laryngospasm. I was especially careful not to provoke any attacks of apnea or laryngospasm, as I have learned to fear sudden death in these attacks. I have been fortunate not to have this outcome occur to me as it has to others.

---

* Read before the Thirty-fourth Annual Meeting of the American Pediatric Society, held at Washington, D. C., May 1, 2 and 3, 1922.

Apnea is a condition which may occur entirely free from any laryngospasm or signs of laryngismus. This is not generally understood; these cases may have several attacks in 24 hours, or 1 or 2 attacks with days of interval. In these, the increased irritability of the peripheral nerves may be easily elicited.

Laryngospasm. These cases are the evident tetanoid cases, in which attacks of laryngismus may occur every few minutes and in which there is not only apnea but also during the attack there may be observed the typical carpopedal spasm. These cases show exquisitely the anodal and kathodal increased sensitiveness to the Thiemisch and von Pirquet electrical formula, and may at times exhibit apnea and laryngospasm, and latent tetany.

In the literature, sudden death, which is an unfortunate outcome of some of these cases of spasmophilia or tetany, latent or manifest, has been variously interpreted. It is described in the earlier literature as a form of asphyxia. The unfortunate patient has a closure of the glottis, and, this not relaxing, sudden death intervenes. This view was disproved by Störk and Pott, and others in whose experience sudden death occurred. Tracheotomy or intubation afforded no relief in these unfortunates. Then the view that sudden death was due to a spasm not only of the glottis but of the diaphragm and accessory muscles of the respiration was advanced to explain the lack of relief from operative procedures. Finally, Escherich and Paltauf adopted the view that the so-called paralysis or tetany of the heart was the cause of sudden death. This latter view was also advocated by Ibrahim. In this communication I will show that this view is the most logical that we can hold to-day. The action of the heart has not been described in detail by any of the authors mentioned. They simply describe the heart appearances on post-mortem. The heart is found in diastole or the right ventricle relaxed—the left ventricle is in a contracted state.

As to infants and children, who have died of laryngospasm or tetany, Escherich calls attention in one of the cases which occurred in his clinic to the *weak* sounds of the heart just preceding death. He says the heart sounds were scarcely audible. He gives no description of the heart action prior to death or during an attack.

THE HEART ACTION IN SPASMOPHILIA.

In an attack of apnea, without any sign of laryngismus stridulus or laryngospasm that is audible, we note at the onset of the attack of apnea that the heart from being quite rapid, as it is in these crying infants, *suddenly slows down,* the beats become less frequent, though quite forcible, their frequency being reduced to half, or to one-third of their normal, or even less than this, and in the state of rigidity, that is, at the height of the apneic attack, the heart may slow down to such a degree that we fear it is about to cease; then, as the apneic state lessens and the infant begins to breathe again, the frequency of the heart beat increases and rapidly attains the normal. At this time the cyanosis, followed by pallor, disappears and the infant takes a deep inspiration; the heart takes on the normal rhythm and then we know the child is out of danger. During the slowing down stage, the heart is quite regular, there is no sinus arhythmia or anything resembling it, but there is a double beat to the heart at regular, slow intervals, so much so that we think every moment there will be an absolute stoppage of the heart action. It is not necessary to have a complete apneic attack in order to elicit this characteristic slowing of the heart beat. In some abortive forms of apnea (true spasmophilia), this slowing of the heart can also be demonstrated.

I regard this *sudden* slowing of the heart as characteristic and pathognomonic of the condition of spasmophilia, or tetany, as the electrical galvanic increased irritability. It is a constant factor and may take its place as a pathognomonic symptom of so-called latent tetany. A most striking example of this in a diagnostic sense is a case which had been operated upon at 5½ weeks of age for pyloric spasm and stenosis. Female infant, at the time of operation weighing 7 pounds, 5 ounces, was brought to me at the age of 16 months for continuation of feeding. The child weighed 24 pounds, 14 ounces, apparently in perfect health. I was examining the patient, who, crying, held its breath a while. I noted the heart slowed down suddenly and markedly at the height of the so-called abortive apnea, for the apnea was not complete. A galvanic examination revealed an anodal opening and closing and kathodal opening and closing of 2½ milliamperes, and a kathodal closing greater than the anadol opening and closing. Upon close questioning, the parents denied any full apneic attacks but said that the child, who seldom cried, would at times hold its breath. This certainly was a case of latent tetany accidentally uncovered during an ordinary examination.

In cases of apnea with manifest laryngismus stridulus or laryngospasm, this slowing of the heart beat is quite evident from the moment of the onset of the laryngeal spasm or apneic attack to the moment of the long drawn inspiratory symptom which marks the termination of the attack. I have seen cases of laryngospasm in which there was a complicating convulsion. During the convulsion, the state of apnea being still present, the heart slowed down to a most alarming extent so that it was feared that the heart had stopped beating. Means of mechanical massage of the precordium were resorted to in order to restore the heart beat. The heart was observed to gradually increase in the rapidity of beat until in the stage of relaxation, as is well known, sopor intervenes, and it is in this state of sopor that we note the slowly increasing action of the heart. These are anxious moments for the examiner for there is no means of knowing in advance whether the increased action will supervene. The patient lies prone, pale, and does not breathe, or breathes so superficially as to be scarcely noticeable. It is no exaggeration to say that the rate of about 20 beats is attained where a normal beat of 110 or 120 preexisted. The whole procedure is so tense as to baffle any count, and when a child is in this state we scarcely can be expected to make a count of the heart beat.

In all of the cases related above, I have been able to establish either before or in the interval of attacks of apnea and laryngospasm or convulsions the highly increased anadol and kathodal irritability of the peripheral nerves to the galvanic current. I have not been able in all of these cases of tetanoid conditions to establish the Chvostek symptom and have been unwilling to excite any attacks by attempts to elicit the Trousseau phenomenon. To elicit the Trousseau symptom it is necessary to cause discomfort or to arouse resistance and this to a possible attack of laryngospasm. At certain seasons of the year the cases of laryngospasm or tetany are so frequent and the children so sensitive that unnecessary irritation of these children should be sedulously avoided.

I have described a phenomenon in the sudden showing of the heart beat which I first mentioned in the second edition of my treatise upon diseases of children, under the heading of a laryngismic attack. This slowing of the heart can readily be brought into connection with the cause of sudden death in these infants. It is difficult to place the exact focus responsible for the slowing of the heart and final stoppage of the heart beat. It may be due to an increased irritability of the so-called vegetative nervous system, to an over excitation of the pneumogastric, and thence the auricular ventricular bundle and its nervous supply. It does seem that in so-called status thymo-lymphaticus that the sudden death can be brought into a close connection with the action of the heart during an attack of apnea, or sudden convulsions. The tetany of the heart is then only the closing act of what I have described in 1906, and which I have elaborated in this paper. In all these cases I have been able to establish by x-ray an enlarged thymus, and all the ear marks of a status thymo-lymphaticus, as it is sometimes called.

I am not prepared to ascribe to the thymus its essential influence in producing the spasmophilic tendency. On the contrary, I feel rather disposed to lean toward the thesis of Escherich that in producing the symptoms of latent tetany, tetanoid states and manifest tetany, the parathyroid bodies will form future foci for study, though their exclusive influence may be doubted in many quarters. Of the numerous cases which I have studied I select a few.

ILLUSTRATIVE CASES.

CASE 1. Male, 6 months, apneic attack 2 months, laryngeal stridor, percussible thymus. X-ray showed large thymus, both lobes enlarged, left lobe more so, in addition laryngismus stridulus. An o and c 2½ milliamperes. An > ka o and c., mild rachitis. Heart suddenly slows down in attacks.

CASE 2. Male, 4 months, artificial and breast fed, congenital heart. Spasmophilia, heart as described, slowing down. An o > c. 3 milliamperes.

CASE 3. Male, 7 months, convulsions 5 times in 24 hours, breast and bottle fed, laryngismus since age of 3 months, now convulsions, constant laryngismus, 3 or 4 attacks in the office. Heart slows down during crying or crowing. An o > c. 2½ milliamperes. Ka o and c. < An o and c. Thymus percussible.

CASE 4. Male, 13 months, breast and bottle fed. Spasmophilia, apneic attacks since age of one month. Two attacks in office. Heart slows down in attacks and almost stops. Thymus enlarged by x-ray. An > ka c and o, 2 milliamperes. An o > c, 2 milliamperes.

CASE 5. Female, 20 months, breast and bottle fed, spasmophilia, laryngismus, apnea. Heart slows down while in sopor. X-ray shows large thymus, left lobe larger than right. An o > c, 2 milliamperes.

CASE 6. Male, 13½ months, no signs of rachitis, spasmophilia, apneic attacks. Heart slows down in apnea. An o < c, 2 milliamperes. Ka o and c, 2 milliamperes. An > ka at 2 milliamperes.

CASE 7. Male, 14½ months, apneic attacks since birth. No signs rachitis. Breast and bottle fed. Apneic attacks, sopor after attacks of convulsions in office. X-ray shows markedly large thymus. Heart suddenly slows down in attacks. An o < c. ka o and c, 2½ milliamperes k > a.

CASE 8. Male, 5 months, survivor of twin, atrophic since age two months, laryngismus, signs of rachitis, craniotabes, attacks of laryngismus constant. Heart slows down in attack. X-ray shows large thymus. An o > c, 2½ milliamperes. Ka o and c < an o and c.

CASE 9. Female, 15 months, convulsions twice daily. Heart in apneic attack slows down. X-ray shows large thymus.

CASE 10. Male, 6 months, apneic attacks 3 months, breast and bottle fed. Attacks of apnea constant. X-ray shows large thymus. Thymus percussible. An o > c, 2½ milliamperes. Ka o < c. An > ka.

Case 11. Male, 7 months. Breast and bottle fed. Convulsions, first at 7 months. Signs rachitis head, spasmophilia, (latent tetany). An o < c. 1 milliampere. Ka o and c, 1 milliampere.

Case 12. Male, 8 months, breast and artificial fed. No rachitis, large percussible thymus. X-ray shows very large thymus. Brought for mixed feeding, laryngeal stridor. An o and c > ka o and c, 2½ milliamperes. This case quoted to show that cases of laryngeal stridor have increased electrical reaction and apneic attacks.

Case 13. Female, 5 months, breast and bottle fed. Epileptiform seizures in which there are no electrical reactions for tetany nor does the heart slow down in crying. Has sudden spasms in which the head is bowed down, no apnea, no slowing of heart in attacks of crying. This case quoted to show that certain convulsions are not spasmophilic, (no tetany, latent or manifest).

Case 14. Male, 7 month, 13 pounds, 15 ounces, developed convulsions after having been under treatment from age of 6 weeks, had disappeared from observation, then returned. Atrophia, only convulsions, no apnea, gets slightly blue when cries. No signs rachitis. An o, an c > 2½ milliamperes. In the interval of convulsion ka o and c, 2½ milliamperes.

Case 15. Female, 2 months, 6½ pounds, malnutrition. At age of 4 months developed attacks of apnea, then convulsions with every onset of fever. Attacks of apnea frequent during the day until 6 months of age. At age of 6½ months the convulsions set in with onset of fever. Signs by x-ray of early rachitis though physically signs not marked except in head, large thymus, especially right lobe. An o and c > ka o and c, at 1½ milliamperes.

Case 16. Male, 4 months, atrophic, 8 pounds, 5 ounces, at age of 7 months spasmophilia, developed apnea. Markedly enlarged thymus. Heart slows down in attacks of apnea accompanied finally by convulsions in one of which the patient died. Here the heart slowed down very markedly in attacks of apnea. Child died while feeding, at age of 7 months. An o < c, 1½ milliamperes. Ka o and c, 1½ milliamperes.

Case 17. Female, first seen at age of 3 weeks. At age of 4 months developed apnea and crowing attacks, markedly enlarged thymus by x-ray. Ka o and c. An o and c, 1½ milliamperes. An o < c. An > ka.

Case 18. Female, 1 year of age, under observation from age of 3 months, attacks of apnea especially marked at age of 1 year. Heart slows down in attacks of apnea. An o > c, 2½ milliamperes. Ka o and c > an c.

30 East 62nd Street.

Serotherapy of Purpura (Archives Médicales Belges, Liége, Dec., 1920). C. Cohen points out the resemblance between purpura and the phenomena of idiosyncrasy. As the symptoms are much alike, the same treatment may prove effectual in both, and Cohen realized this in the six cases described. The six children had been having recurring purpura with rheumatoid pains, fleeting edema, bad general condition and albumin, tube casts and erythrocytes in the urine at times. These waves of symptoms returned every week or two in the first case described, rebellious to all treatment, including calcium chlorid. After three months of ineffectual measures, the boy was injected with 4 c.c. of his own serum at three day intervals, a series of four injections, with another series a few weeks later. There has been no return of the purpura since, his health being excellent. In another child the purpura developed after a severe fright, and he was given four subcutaneous injections of serum from his mother's blood, with a second series two weeks later, and complete cure. In all these cases the number of leukocytes was high and complete recovery followed this serotherapy in every case except that one child died from intercurrent pneumonia after the injections. This child had been treated with diphtheria antitoxin as the most convenient form of serotherapy. In all the cases the improvement became manifest toward the third or fourth injection of the serum, that is, about the tenth day, which is the usual period for production of antibodies.—*Journal A. M. A.*

THE SYMPTOMATOLOGY OF STRUCTURAL ABNORMALITIES OF THE GASTROINTESTINAL TRACT IN CHILDREN.*

By Charles G. Kerley, M.D.

New York.

In different contributions during the past 3 years, the result of our observations on gastrointestinal disorders in children, depending primarily upon mechanical agencies, have been offered to the medical profession. Our x-ray studies of the gastrointestinal tract in chronic digestive disorders now cover a sufficiently wide field to allow us to draw certain fairly definite conclusions, and thus establish a co-relation between an anomaly, or an acquired abnormality and a symptom complex.

Type of Patient. The patients upon whom these studies were made were with few exceptions very much alike. They showed malnutrition and they had some persistent or recurrent gastrointestinal disorder and came to us because of such ailment.

Symptomatology of the Ptosed Stomach, and of the Dilated Stomach. In the ptosed or drop stomach there is a delayed emptying, largely because of the changed relations of the pylorus to the stomach proper. The ptosed stomach is elongated, is in a vertical position and requires a longer emptying period than the normally situated organ.

In the dilated stomach there is a defective muscular tone and hypomotility. The results in both conditions are very much the same—*stomach residue*—when the organ should be empty. Stomach residue after 5 hours causes 2 symptoms: first, a loss of appetite, and second, recurrent vomiting. We have yet to see a residue case with a normal desire for food; they are those who have to be urged and stimulated to take food, particularly at the mid-day and evening meal. The recurrent vomiting in a residue case occurs at fairly definite intervals and the patient has usually been treated for acidosis.

Stomach Colic and lesser stomach pains appear to be associated with gastrospasm, exaggerated motility. In gastrospasm we have found 2 causative factors—hyperacidity and pylorospasm. Not all cases of hyperacidity, however, have gastrospasm, or pain. This has been proven by my co-worker, Dr. Edward J. Lorenze, Jr., in a series of cases that we have studied by means of gastroanalysis. In those with the complaint of stomach pain, we have found the condition of hyperacidity usually, hypermotility and pylorospasm invariably.

---

* Read before the New York Academy of Medicine, Section on Pediatrics, April 14, 1921.

Vomiting. In a vomiting child, whether recurrent at fairly frequent intervals, habitual (daily), or occasional vomiting, we have proven the ptosed stomach, which as already mentioned is mechanically difficult of emptying and shows hypomotility and residue, or the dilated stomach with hypomotility and residue, or pylorospasm with residue. The spasm may be occasioned by causes operative in the stomach, as in hyperacidity, or elsewhere in the gastrointestinal tract, as in the following case:—

For 5 months a boy, aged 8 years, had been under our care for recurrent attacks of vomiting. The seizures occurred at about 2 months intervals and continued at frequent intervals for 10 days. At the commencement of the attack, the child weighed 71¼ pounds. In 11 days he had lost 10 pounds, weighing 61¼ pounds. He was referred to Dr. Le Wald for an x-ray examination who reported as follows:—

March 11, 1921. The stomach is dilated and ptosed; the greater curvature is one-half inch below the umbilicus. There is evidence of pylorospasm on both fluoroscopic examination and recorded on films. The spasm lasts about one hour when it relaxes and allows a small amount of food to pass through. 5 hours, 30 minutes—there is a large retention in the stomach amounting to about three-fourths of a meal, in spite of the fact that the patient vomited part of the meal. Only about 2 ounces of the meal have passed through the pylorus, indicating extreme stenosis, either due to spasm or organic construction. 24 hours—the stomach is empty. Some of the meal has reached the sigmoid. There are apparently traces in the region of the appendix. 48 hours—there is statis in the colon. There has been no advance in the last 24 hours.

March 10. *Injection of the Colon.* The injection has traveled throughout the colon. The ileocecal valve is incompetent. The sigmoid flexure is elongated, being about 2 times average length. The hepatic flexure is redundant. 23 hours—the colon shows marked spastic contraction. Some of the injection remains in the cecum. Traces remain in the rectum.

SUMMARY. The findings indicate an extreme grade of pyloric stenosis; whether due to spasm or other origin it is sufficient to render surgical intervention necessary unless relieved by medical measures. There is elongation and spastic contraction of the colon. The ileocecal valve is incompetent. The spastic condition of the colon may be an important factor in the production of the colonic stasis; and a remote cause for the pyloric-spasm and consequent vomiting.

Dr. Howard Barber has shown in some very instructive experiments in dogs, that lesions and irritations of the lower intestinal tract will produce exaggerated stomach motility and pylorospasm. It has been our observation repeatedly that our cases of pylorospasm almost invariably are those who have abnormalities with retention at the cecum or some point in the large intestine or rectum.

Later observations in this boy reveal the fact that there is rarely a complete evacuation. This had been demonstrated in the use of enemata shortly after a supposed normal evacuation had taken place. Fecal material had been found in the rectum by means of digital examination one hour after evacuation. The original weight was made up in 11 days after establishing a normal functionating pylorus.

Habitual Intestinal Colic or Lesser Pain, such as a sensation of discomfort, we have found to be due to gas retention. Such gas retention occurs with sacculations, dilations and angulations.

A Pronounced Case of Abdominal Pain. A boy 11 years of age. The seizures had occurred at intervals for 2 years and were becoming more frequent and more severe. The diagnosis of chronic appendicitis had been made with recommendations for operation. Our examination failed to demonstrate sufficient grounds for operation; diagnosis of dilation of the cecum seemed justifiable, according to our experience with similar conditions. The boy was x-rayed and the cecal dilatation was present, and was found to be due to an acute colonic angulation immediately beyond the hepatic flexure. Abdominal pain due to such causes may be paroxysmal and severe or give rise to a feeling of abdominal discomfort, without localization, and has to be considered in its relationship to symptoms of chronic appendicitis.

Dilatations and sacculations are apt to be found in the cecum and sigmoid. Angulations we find in the colon and sigmoid, particularly at the colonic-sigmoid junction.

Habitual Constipation. Constipation that resists a proper diet and simple medication will usually be found dependent upon defective intestinal mechanics. We have had persistent constipation explained by ptosis of the colon, by angulations at different points, by elongated sigmoid, and the dilated sigmoid. It is not claimed that such conditions necessarily mean constipation.

Rectal Constipation. By rectal constipation we refer to the condition in which the rectum is rarely free from fecal material. There is a daily evacuation, but the rectum is never completely empty. This condition we find in those with an over-active anal sphincter.

Unexplained Low Grade Fever. We have found the explanation of the persistent low grade fever, 100° to 101°, in defective bowel elimination, dependent upon structural abnormalities of the intestinal tract.

132 *West* 81*st Street.*

ETIOLOGY OF RICKETS (Lancet, London, July 1, 1922). The observations on the etiology of rickets reported on by Chick et al. disclosed that rickets developed during winter and spring under excellent hygienic conditions in infants receiving a diet composed of fresh milk from stall-fed cows and to which sugar was added, and was prevented in the case of children receiving a diet containing cod liver oil, more milk, and less carbohydrate. Both milks were low in vitamin A content. Rickets did not develop in summer on either diet. Rickets can be cured by cod liver oil and by exposure to sunlight, or to the radiation of the mercury vapor quartz lamp. The first six months of life is a period of special susceptibility to the onset of the disease. Rickets may develop in an infant whose general condition is good or improving, and healing of the bones may occur independently of improvement in the general condition.—*Journal A. M. A.*

ACID MILK IN INFANT FEEDING*

By Henry I K. Shaw, M.D., and Frank Williams, M.D.

Albany, N. Y.

The use of acid or sour milk in feeding small babies seems on first thought to be irrational, unsuitable and contrary to all principles of scientific infant feeding. Agitation for pure clean milk has been made on behalf of the babies for many years past and today milk is judged by the number of bacteria it contains. The acid milk used in feeding infants should only be prepared from clean fresh milk. Its use does not oppose dairy hygiene or let down the bars of cleanliness, for dirty and unsanitary milk will remain dirty, unsanitary and harmful whether alkaline or acid, raw or boiled. Teixeira de Mattos informs us that buttermilk has long been used in Holland for feeding babies as well as calves, pigs and chickens and refers to an article written by Campert in 1770 which speaks of its use in infant feeding. Ballot wrote an article in 1865 advocating its use and de Mattos in 1902 in a scholarly paper urged its employment and reported a series of infants successfully nourished on buttermilk. During the following ten years many articles appeared both in this country and in Europe in which its use was commended and recommended. Only a few articles have been published since 1912 on the use of acid milk although numerous papers have been written on eiweiss or albumin milk. Buttermilk is used in the preparation of albumin milk but no emphasis is made on the amount of acidity or the lactic acid content.

There is a distinct difference between buttermilk and acid milk. Buttermilk is a by-product in the manufacture of butter and is obtained after churning sour cream and removing the butter. It is frequently diluted with the water added to the churn during the butter-making and is practically fat free. It is difficult to procure with any degree of regularity and its composition and degree of acidity vary with each churning.

Acid milk is obtained from fresh sweet whole milk which has been kept in a warm place until it thickens spontaneously or to

---

* Read before the Thirty-fourth Annual Meeting of the American Pediatric Society, held at Washington, D. C., May 1, 2 and 3, 1922.

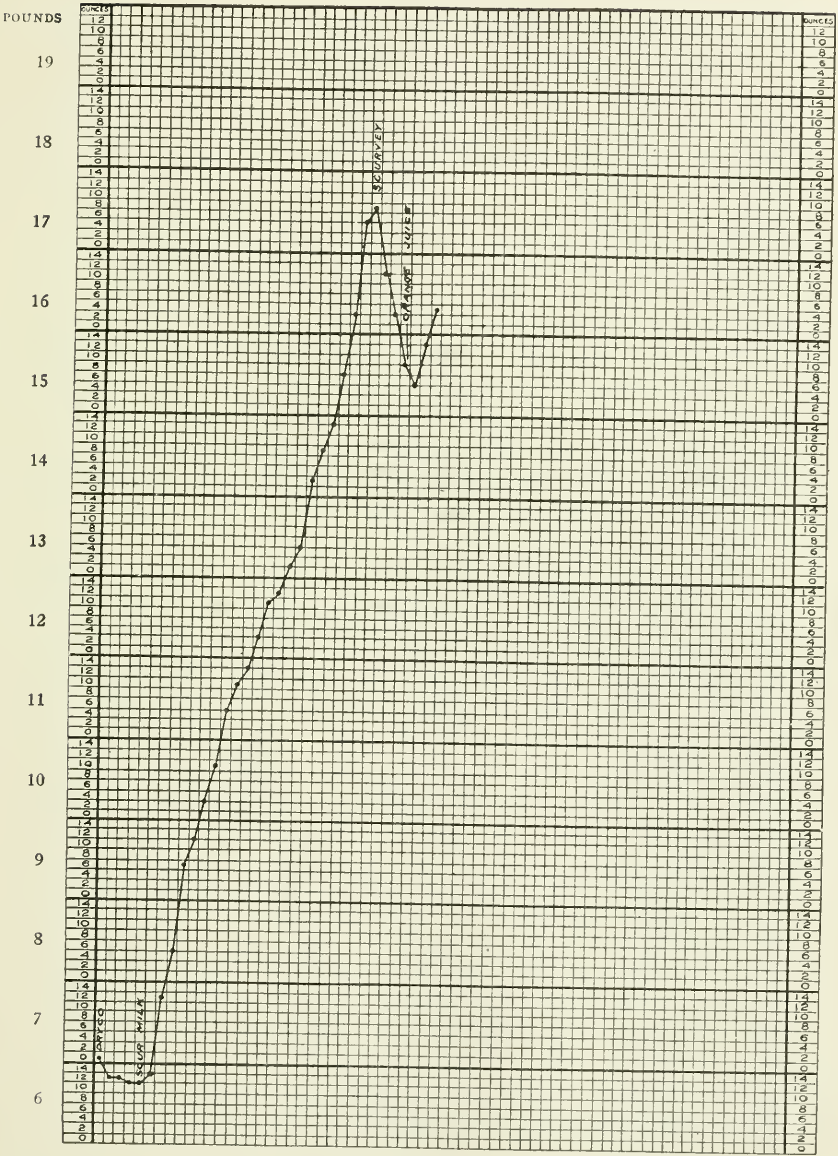


FIG. 1. Weight chart, June-October, 1921. Peter Rowe, age two years.

which cultures of living lactic acid bacilli have been added and then allowed to sour and thicken.

Our views in regard to the reaction of the milk used in feeding babies have changed materially in the past 25 years. Alkalies were first recommended on the belief that it was necessary to change the reaction of cow's milk which is slightly acid to conform with breast milk which was believed to be alkaline. This was shown to be fallacious and alkalies were then advocated to retard or prevent the rennet coagulation of casein in the stomach. It was also thought their addition in the food would reduce the acidity of the stomach contents. Clark, in the Journal of Medical Research, protested against the addition of alkalies in infant feeding as he claimed they displaced from the intestines a normal bacterial ferment and replaced it with proteolytic or putrefactive processes which are responsible for many of the digestive disturbances of infancy. Sato has proved experimentally that the addition of alkalies exert a decidedly unfavorable effect on the retention of calcium.

The acid reaction in sour milk is due to the action of a special group of micro-organisms known as the lactic acid group of bacilli and the claim that they exert a favorable influence in certain digestive disturbances of infants is well established. Lactic acid is produced very rapidly by these bacteria and in from 24 to 48 hours a quart of clean fresh milk kept at room temperature will have reached such a high acidity that it spontaneously curdles. There is no evidence to show that this lactic acid causes chemical or bacterial injuries to the infant. Hayem and Lesage administered 15 to 20 gm. of pure lactic acid in 24 hours to infants without producing any harmful results. It appears to exert a decidedly favorable influence in metabolism in the absorption and retention of the nitrogen and salts. The casein is changed by the action of the acid from calcium caseinate to lactate of casein. Casein lactate is not acted upon by rennin and the formation of large tough curds is prevented. Hence the casein is in a state of fine coagulation similar in some respects to that of mother's milk. This renders the albumin in acid milk more digestible and it can be given to young infants in larger proportions than in sweet cow's milk. The calcium being set free provides salts which are soluble and more readily absorbed.

Hydrochloric acid and lactic acid appear to play supporting rôles during gastric digestion. Biedert claimed that lactic acid can take the place of hydrochloric acid, but less effectively. At the beginning of the meal the free hydrochloric acid combines with the casein and disappears until near the end of digestion. Artificially fed infants require more hydrochloric acid as the casein in cow's milk has a greater saturating power for acids.

Lactic acid makes an early entry on the scene and the combination of these two acids holds intestinal putrefaction in check as well as the growth of bacteria in the upper intestinal tract. Escherich called attention to the fact that the gastric juice of infants fed on cow's milk was a poor intestinal disinfectant as so little free hydrochloric acid is present and also stated that lactic acid had a decided antiseptic action.

Several authorities claim that the beneficial effects of buttermilk or acid milk are due to the presence of living lactic acid bacilli. Morse and Talbot, for example, in describing buttermilk say that "the lactic acid organisms which it contains should also be of advantage in these disturbances of digestion which are due to organisms to which the lactic acid bacteria are antagonistic. This possible advantage is lost of course when buttermilk is boiled." They further state "it is probable that the degree of acidity of the buttermilk plays some part in its action. This cannot be regulated in commercial buttermilk but can be when the milk is soured by the addition of lactic acid bacteria since the production of acid can be stopped at any time by boiling the mixture." This of course would kill the bacteria.

In the preparation of buttermilk as recommended by different authors the food is boiled before it is used. This is also the case in the preparation of acid milk and albumin milk. A bacteriological study of these foods at the New York State Department of Health laboratory showed no growth of lactic acid organisms in the boiled foods so that the favorable results must be due to the high acid content and not to the action of living lactic acid bacilli.

The amount of acidity was determined by titration with the decinormal sodium hydrate solution with phenolphthalein as the indicator. Richmond found that the acidity of milk was reduced by boiling. The acidity of milk direct from the cow averaged 23 while after boiling it fell to 12. A large number of acidity determinations of acid milk were made in the laboratory of St. Margaret's House by Dr. Frank J. Williams who assisted me in this study and the average acidity before boiling was 100 and after boiling it was reduced to 80.

The high acidity exerts a remarkable germicidal effect. Heinemann, in the Journal of Infectious Diseases in 1915, showed that pathogenic bacteria such as tubercle, typhoid, paratyphoid, and diphtheria bacilli and spirilli were destroyed when the acidity reached 45 and that no bacteria of the coli group survived an acidity of 60. This has been confirmed by many investigators. Leichtentritt made control tests in buttermilk that had been neutralized and found the results did not differ from those in sweet milk. He also found that if the acidity was over 50 there was no growth when coli bacilli or even a small portion of an infant's stool were inoculated. DeWitt Sherman states that milk coagulates at an acidity of 50 and that the lactic acid bacilli themselves are destroyed when the acidity reaches 190. It is of interest to note that all authors call attention to the fact that the reaction of the stools is alkaline in babies fed on these highly acid foods. Hayem found that the ammonia in the urine was not increased and that the use of acid milk does not cause acid intoxication. Our tests of the urine acidity showed not only that there was no increase in the acidity but that the acidity was diminished in the majority of the cases examined.

Most of the advocates of the acid foods, buttermilk, acid milk and albumin milk, limit its use to gastrointestinal disorders and after improvement or in the course of one or two months to switch over to modifications of fresh milk. Bradley of St. Louis in 1912 was one of the first to recommend acid milk as a steady routine diet for both healthy and sick infants in institutions. The writer in 1910 in the Infants' Home adopted the de Mattos method of preparing artificial buttermilk in which whole milk is soured by the addition of a lactic acid culture and after coagulation adding sugar and flour and boiling for three minutes.

This institution has a daily population of from 20 to 30 bottle babies and the results were so satisfactory that this method of feeding is still in use. It is safe to say that over 3,000 babies have been raised on this food with more or less success. Other methods have been tried during this period but the Sisters have always requested a return to the sour milk mixtures as the babies gained faster, looked healthier and were happier. Made in large quantities it is very easy and simple to prepare and has several advantages for use in infants' institutions.

The results in private practice have not been so successful or satisfactory and for some unexplained reason its use did not meet with the same success in another infant institution in the same city. At this latter institution, St. Margaret's House, the malt soup mixtures were prepared one day about seven years ago, with acid milk instead of the customary sweet milk and the mistake was not discovered until after all of the babies had taken one bottle. It was taken as eagerly as the ordinary feedings, so it was decided to try the experiment of using the acid milk in a series of babies and compare the result with babies fed on malt soup mixtures made in the orthodox manner. A frequent and distressing condition found with the malt soup babies was the irritated and often excoriated buttocks, a result of frequent loose stools. These stools were acid and often foul and offensive and malodorously perfumed the wards. The most noticeable effect of the acid milk malt soup mixtures was the absence of sore buttocks and stinking stools. After a short trial the use of sweet milk was discontinued and acid milk was used in all the malt soup mixtures. The acidity of the malt soup mixtures made with sweet milk averaged 6 which is low on account of the bicarbonate of potash in the malt soup extract. Made with the acid milk the acidity averaged 48. We are now using the plain malt extract which does not contain the alkali with satisfactory results and these mixtures have an average acidity of 65.

At the request of one of the managers of St. Margaret's about a year ago we fed five babies on acid milk mixtures made from spontaneously soured milk. We followed a technique recommended by Miss Thesinghes, a trained nurse from Holland, who claimed it was the method in general use in that country. Fresh whole milk is poured into a bowl covered with cheese cloth and allowed to sour for two days in a warm room until it thickens like junket. It is then churned in a small glass butter churn for several minutes until it resembles fluid milk. A heaping tablespoonful of sugar and one of flour for each quart are mixed into a paste with a little of the milk and this is added to the churned milk and then boiled for three to five minutes while stirring. If in the cooking it appears as though separating a little more flour should be added. We found that by adding a little of the soured milk to the fresh milk as a "starter" it would sour sufficiently in twenty-four hours. This can be fed without dilution to very small infants although it is best to add from one-half to one ounce of water in each feeding for the first few days.

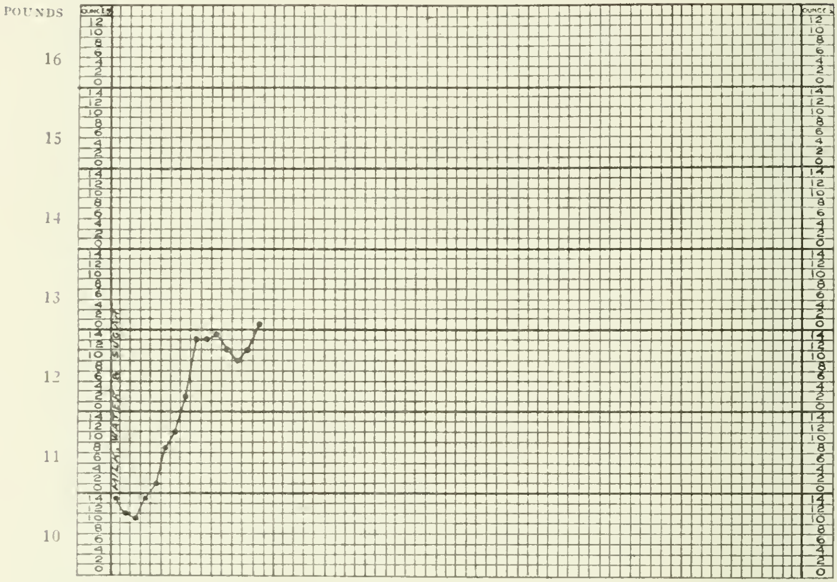


Fig. 2. Weight chart, November, 1921-April, 1922. Frank Gallagher, age 4 months.

The results have been most satisfactory and up to May 1st, 46 babies have received this food at St. Margaret's besides 14 in private practice. Most of the babies made very rapid gains in weight, often more than a pound the first week and while some have occasional attacks of vomiting and colic yet the babies appear so well and gain in weight so steadily that the food was not changed. In five out of eight cases of general and facial eczema there was a marked improvement in the first week. No signs of rickets have appeared as yet in any of these acid milk babies. Nearly all of the colored babies who remain in the hospital for a long period show marked signs of rickets but the one colored baby who has been fed on this mixture for five months appears normal in every way. One baby developed a well defined case of scurvy. This baby was admitted June 4th when two days old weighing seven pounds and was given a regulation sweet milk formula but lost in weight and then placed on dryco but did not gain in weight. She was given acid milk on July 4th when she weighed 6.11 and gained steadily until March when the weight was 17.8. At this time she became fretful and sensitive and lost her appetite. A little later the gums showed a characteristic bluish discoloration. She lost in weight but when she was given orange juice without any other change in the diet the pain disappeared, her appetite returned and she again began to gain in weight.

In order to prevent the destruction of the antiscorbutic vitamine we now boil one-half of the formula with the flour and sugar and after the milk is cooled the remainder of the uncooked acid milk is added.

The acid milk did not agree with 11 hospital babies and 5 private cases. Several of the hospital babies were given the acid malt soup mixtures and this proved successful and later three were again put on the acid milk and are now gaining and thriving. Three babies died but were practically moribund when admitted to the hospital and died within 48 hours. The other case was a baby admitted August 6th, two weeks old, weighing 4 pounds, 10½ ounces. She was at once placed on acid milk and gained steadily until January 6th when she died suddenly. Her weight was 11 pounds and the autopsy revealed no cause for death except a greatly enlarged thymus. The youngest baby to which this food was given was two days old and he gained satisfactorily until he was 6 weeks old when he was taken away from the hospital. It is not necessary to give the clinical histories of the entire series but the case of twins admitted November 22nd when four and a half months old is worthy of mention. One of the babies, Florence G., was in very poor condition and weighed 8 pounds, 2 ounces and in marked contrast to her brother Frank G., who weighed 10 pounds, 14 ounces and was healthy and well nourished. We gave Florence the acid milk and kept Frank on the sweet milk formula on which he had been thriving. Florence weighed 13 pounds, 2 ounces on April 20th and is cheerful and looks plump and well. She gained 5 pounds in 5 months. Frank on the other hand only gained 2 pounds, 14 ounces in the same period and now weighs 2 ounces less than his sister.

Marriott and others have shown that babies fed on acid milk can digest and assimilate much larger amounts of proteid than babies fed on sweet cow's milk mixtures. The addition of flour and sugar gives us a food with a caloric value of 30 or over to the ounce.

The babies fed on acid milk mixtures for long periods of time in institutions look healthier and thrive better on the average than those fed on the regulation sweet milk formulas. There is no doubt that in acid milk mixtures, however prepared, we have a most satisfactory method of feeding both sick and well babies over a long period of time and one particularly adaptable in infant institutions where the problems of infant feeding are especially difficult.

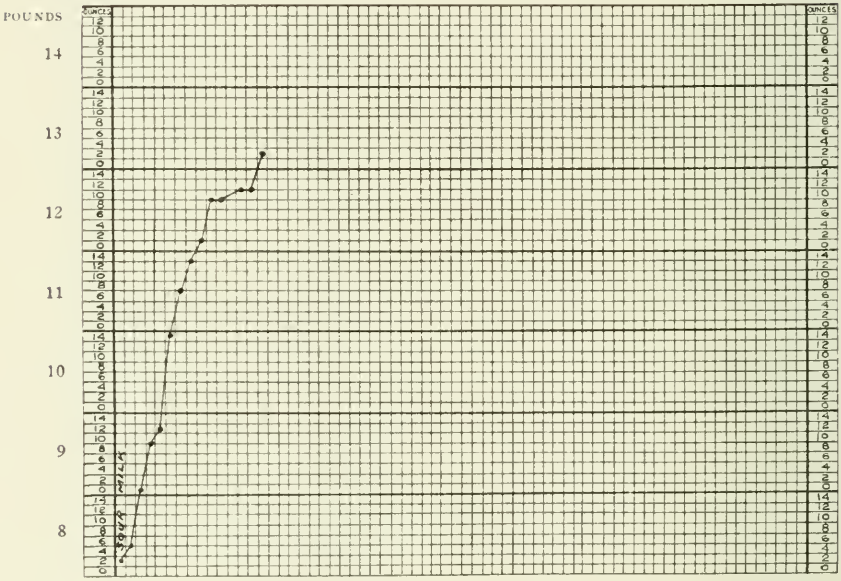


FIG. 3. Weight chart, November, 1921-April, 1922. Florence Gallagher, age 4 months.

OUR CHANGING ATTITUDE TOWARD THE NUTRITIONAL DISEASES AND DISORDERS.

By William Weston, M.D.

Columbia, S. C.

In an article read before the Section on Pediatrics of the Southern Medical Association, Louisville, Ky., Nov. 15-18, 1920, entitled "Causes and Management of Athrepsia" I endeavored to demonstrate: 1st, that there appears to exist a definite relationship as regards etiology, symptoms and treatment between athrepsia, acrodynia, pellagra, beri beri, scurvy and rickets; 2nd, it seems that they are caused by some food deficiency, probably vitamine or salts, and in 2 of these, rickets and acrodynia, probably both vitamines and salts are concerned; 3rd, that athrepsia was caused by a deficiency of vitamines in the food; 4th, that while whole cows' milk contained the fat soluble vitamine in sufficient amount, the reduction of the fats in the process of modification so diminished the fat soluble vitamine that damage would result in the production of disease; 5th, that cows' milk is often deficient in the water soluble (antineuritic) vitamine.

I especially wish to discuss at this time proposition 5, namely, that cows' milk may be deficient in the water soluble vitamine. This is a matter that has received much thoughtful investigation in widely separated sections of this and other countries, at different seasons and under all conditions. There have been 2 schools of opinion, one holding that raw cows' milk prevents or cures scurvy and the other contending that cows' milk is deficient in the antiscorbutic vitamine, and would therefore neither prevent nor cure scurvy. Recent investigations have reconciled these 2 positions, it having been conclusively demonstrated that milk does or does not contain the antiscorbutic vitamine depending upon the fodder that is rationed the cow. Animals are unable to synthesize the vitamines. If they receive a fodder that is rich in this vitamine, the milk is correspondingly rich in this respect. If the fodder is poor in this quality, then the milk will not contain this vitamine in sufficient quantity to act as an antiscorbutic.

My error was due to the fact that my investigations were conducted on milk from stall-fed cows whose food consisted of cotton seed meal and hulls, and if this vitamine was present at all it was in an inappreciable amount.

It has long been known to stock raisers that the young animals grazed on certain pastures were often so feeble that they did not survive, and that even older stock failed to thrive although the grass seemed to grow upon them in sufficient amounts. This has been explained as a soil deficiency which in turn produced a deficiency in the grass. This may be remedied by so fertilizing the soil with either mineral or animal fertilizer that calcium is restored to the grass. When this is done animals thrive upon it, and the milk of suckling mothers becomes nutritious.

It is natural to assume that if food has such an important influence upon the milk of the lower animals that it should hold good in the case of nursing mothers. We have excellent reasons for believing that it does, since rickets and athrepsia often occur in breast-fed infants.

In view of the widespread prevalence of rickets—of all diseases the most often overlooked—in both breast- and artificially-fed infants, it is well worth our time to consider this disease in connection with our discussion of the vitamines and salts and their etiological relationship.

Our attitude in regard to the etiology of rickets has undergone a very material change within the past 2 years. We formerly looked upon it as almost inseparably associated with bad hygienic surroundings and in babies artificially fed on foods rich in carbohydrates, and deficient in fats. All of which we now acknowledge, but affirm that this mere statement of condition is far from being a satisfactory etiological explanation. In the past we neglected to investigate the diet of the rachitic infant's mother, or, if the baby is receiving cows' milk, the food of the cow. In the future it is probable that attention to this matter will be the key to our plan of treatment.

It is perhaps incorrect to positively assert that the sole cause is a deficiency of the fat-soluble vitamine in the food, although some investigators are so sure that it is that they use the expression fat soluble vitamine and antirachitic vitamine as synonymous terms. They point with assurance to the fact that cod-liver oil is practically a specific cure. We must acknowledge that if cod-liver oil is administered in sufficient quantity that it will both prevent and cure rickets. We also agree that it seems that the fat soluble vitamine is present in cod-liver oil in greater amount than in any other known food and exists in such an assimilable form that it quickly stops calcium loss and promotes its deposition.

Hess and other investigators have demonstrated that the fat of human and cows' milk does not always possess vitamines, inasmuch as babies sometimes develop rickets on a raw milk containing a normal amount of fat, and that these babies get well when cod-liver is given. It has also been shown that often babies do not develop rickets when fed milk containing little fat, but receiving other foods rich in other vitamines. I submit that the percentage of fat contained in the food the baby takes is by no means an important factor in the etiology of rickets, but that *the* important factor is that from whatever source the milk is derived, the mother or cow, whichever the case may be, must receive a generous and balanced diet in order to furnish an antirachitic food. This food then will contain all the vitamines and salts.

It is not unusual to find that babies who nurse pellagrous mothers have rickets. On several occasions when this was observed I have had the mother's milk analyzed and it was seldom found that the fats were much below the normal percentage. Yet, when these mothers were fed what we term a balanced diet, the baby steadily improved and invariably got well. Of course this statement does not apply to those cases where the mother has reached a very advanced stage of the disease.

My experience in the treatment of athrepsia is most enlightening and it may be of interest to you to relate certain experiments made more than a year ago which I consider of great practical value.

I found that very often athreptic infants reached a certain gain in weight beyond which an increased amount of lactic acid milk did not materially influence weight. It was observed that when the fat was increased as high as 3½ per cent. the weight was little influenced, but that a digestive disturbance often resulted. Remembering the experiments of Casimir Funk, the investigations of MacCollum and others, I commenced to add the inner cuticle of rice to the lactic acid milk containing fat. In each of these cases in which the weight was stationary there was a prompt gain. In no case did I change the percentage of fat. Often the gain was so rapid that I feared that I might be overfeeding the baby, but as none became upset my fear soon subsided and in no case was the food reduced in either strength or quantity. In some of these cases, in which the gain in weight was so spectacular, a point was reached beyond which there was no marked gain although in these cases the food was increased. In others, when the weight became stationary, increase of food resulted in fluctuation of weight, although there did not appear symptoms of either gastric or intestinal indigestion other than that in some a loss of appetite was noted. Reduction in fat generally resulted in loss in weight. This indeed was a puzzling situation, but after some hesitation and many misgivings I determined to try a feeding of soup composed of vegetables rich in salts and the water soluble vitamine in place of one of the feedings of lactic acid milk with the whole rice gruel. This would seem superfluous so far as the vitamine was concerned, but it must be remembered that it has been proved in the treatment of scurvy that sometimes there exists an idiosyncrasy towards a particular food containing the antiscorbutic vitamine. In these cases of scurvy, sometimes potato acts much better than orange juice and vice versa.

The case that I selected was a baby that had been sick since spring, first with a very severe infectious diarrhea that had lasted about 8 weeks and had since been markedly athreptic. It was now October and the weather was very warm. He had gained from 11 pounds to 14, but around the latter figure his weight fluctuated, sometime going down to 13 pounds and just for a day it went as high as 14½ pounds. This condition lasted a week. He was quite pale and his muscles flabby. The first week after the soup was added he gained a pound, his appetite had improved and he was in good spirits. I allowed the mother to take him home with the warning that no change was to be made in his food without my consent and that if he became upset I was to be notified immediately over the long distance telephone. I heard regularly each week and each letter brought good news. The formula was increased in amount from time to time, otherwise no change. Three months later she wrote that the baby had gained regularly and was now 30 pounds, was strong, running all about, his cheeks rosy and, to further quote her language, "the pride of the town." The above case was by no means an exceptional one and is fairly illustrative of my experience in this treatment of athrepsia.

I especially wish to call to your attention that it has been my observation that by the addition of these vitamines and salts the toleration for fat appears to be greatly increased. In several of the cases that showed a limited toleration for fat I was enabled to add fat in increasing quantities after the additions were made as described above, without evidence of disagreement.

There are certain facts that we must keep in mind in order that our feeding cases receive necessary amounts of vitamines and salts: 1st, the cows from which the milk is gotten must receive a generous allowance of vitamine-containing fodder; 2nd, it is less injurious to milk to bring it to a temperature of 212° for 5 minutes, than it is to keep it at a temperature of 145° for 30 minutes; 3rd, the Just roller process does not appear to affect the vitamines or salts of milk. There is a question, however, yet unsettled, as to how long milk thus treated will retain its nutritive value if exposed to atmospheric influences.

A word in conclusion as to the nature of vitamines. We know that they exist and that they have certain essential functions, but we do not know their chemical composition any more than we know the chemical composition of the immune bodies. We are reasonably sure that in the higher animals they cannot be manufactured from within, but must be supplied from well recognized sources. We are also quite sure that these mysterious bodies must be constantly supplied in order to maintain health.

CHRONIC HYDROCEPHALUS IN CHILDREN (Deutsche medizinische Wochenschrift, Berlin, May 19, 1922). Cassel has found the prognosis of syphilitic hydrocephalus, as a rule, unfavorable. A number of children succumb to the cerebral symptoms without securing any benefit from energetic antisyphilitic treatment. A complete cure is rarely accomplished. Most patients retain at least mental defects that are more or less marked; many become grave neuropaths that are a great burden to their family. However, in spite of the unfavorable prognosis in most cases, in no case should energetic treatment be neglected.—*Journal A. M. A.*

SOCIAL SERVICE IN THE CURE AND PREVENTION OF HEART DISEASE*

By A. L. Goodman, Ph.G., M.D.

New York.

In gauging the need of social service among various types of medical or surgical disorders, a good way to judge its urgency is to consider the measure of success attendant on its application. Thus we find many diseases that cannot, in their nature, respond readily to a system of follow-up work. These are diseases that attain their maximum of therapeutic assistance in the hospital itself. Then again, there are cases that might at one time have benefited by intelligent after-care, but, through mishandling or neglect, have reached a stage where such help is vain and might therefore as well be omitted. In the vast majority, however, are those diseases that *do* respond to social service administered as subsequent treatment to the preliminary hospital care. In the foremost rank of these stand the cardiac disorders.

In no branch of hospital social service and after-care is there more gratifying result than that attendant on any work with heart disease. To discover the reasons for the well-nigh miraculous achievements attained along these lines, it is necessary to touch briefly on the medical treatment required in the combating of this disease.

Let it be distinctly understood that I am attempting no abstruse, technical dissertation on the various ramifications of heart disease. My purpose is to point out the need for the intelligent after-care of such cases as leave the hospital with the greatest part of the struggle still before them. I wish to discuss not what the doctor *has* done but what social service *can* do.

In a recent survey made in this city it was approximated that at least 20,000 school children were suffering from some form of cardiac disease. Six hundred of these cases came within the Yorkville district in which our hospital is situated.

In an address to the Glens Falls Medical and Surgical Society, delivered shortly after the publication of the above statistics, I attempted to point out the need of a more extensive supervision of cases of heart disease than can be given in the hospital. It was then the distressing province of the doctor to stand helpless in the face of constantly recurring instances of this malady, displayed by children who returned to us regularly after short periods spent in their own homes. Could a more discouraging prospect present itself to the conscientious physician than the needless damage done to patients, well on the road to comparative recovery, by the ignorance and consequent neglect characterizing the home care of these children? With each recurrence of an attack, the question would naturally arise as to the wisdom of giving the best care that modern therapeutics could devise if that care were to be temporary only, and therefore productive of no lasting results. For let it be distinctly stated that a diseased heart, cared for only intermittently, is a heart that is doomed to progressive steps in the downward direction. The diseased heart needs constant supervision and intelligent care if it is to better itself or even to hold its own.

---

* Read before the Association for the Cure and Prevention of Heart Disease. New York Academy of Medicine, December 10, 1920.

Heart disease in children is not generally the hopeless condition that so many consider it. There are far greater chances of absolute recovery among organic cardiac disorders of children than among these same when found in the adult. The disease in later life has many concomitants not found in a patient's earlier years, among them degenerated arteries (arteriosclerosis, atheroma), chronic renal diseases, various poisonings of the system. There is an augmented arterial pressure that comes with advancing age. There are also frequently the symptoms of cardiac failure, rarely to be found in the young.

Most cases of endocarditis in children are due to acute rheumatic infection. The latter, therefore, must be carefully watched and treated not only during the period of time spent in the hospital but also in the far greater amount of time spent in the home.

Looked at in this light, the work done in the homes can be considered preventive, as well as curative. (One can ward off the attack that is apt to follow the one already treated by guarding against those factors that reinduce such disturbances.) By so doing, moreover, it is sometimes possible to prevent the occurrence of the greater malady by the care given to the lesser.

At each warning of trouble the child should be placed in bed and salicylate of soda administered. (The actual prescribing of any medicine should be undertaken by no one save the physician). Extremes in temperature must be guarded against in the case of children subject to rheumatism. The methods of clothing and bathing should conform to this principle. The diet should be restricted, eliminating primarily tea, coffee and alcohol, and, in the line of food, all forms of beef (including extracts, soups, gravies and meat jellies), highly seasoned or fried dishes, acids and sweets, particularly pastry and candy.

It will readily be seen that constant supervision of the home is needed to insure the carrying out of these rules. Only through the ministration of the visiting nurse and the child's attendance in the clinic can this be accomplished. The disposition among the ignorant to discontinue all precautions at the child's first sign of good health is well known to doctors who have to deal largely with the uneducated parent. So much for the rheumatic forms of endocarditis.

It might be as well to state here that, with few exceptions, no absolute rules can be formulated for the home care of heart disease. No two affections are identical; and while symptoms and formative organic changes may subdivide cases into large general classes, their treatment *must* be individual to be effective.

Among the exceptions to which I have just made reference, are the following few rules, practically general in their applicability to most forms of this disease:—

There is no cardiac disorder that does not require both physical rest and mental quietude. The importance of the latter is frequently overlooked, to the eventual detriment of the patient's condition. The alternation of rest and exercise, the latter in its mildest forms, is beneficial in certain cases where improvement has already set in. (The ordering of any form of exercise must be left in the hands of the physician. Far too much danger is attendant on the transference of this decision to any other authority).

The regulation of diet must include the quantity, as well as the nature, of the food given. Overloading the stomach by giving it even the amount consumed by a person in normal health is apt to have disastrous consequences, causing, as it frequently does, the congestion of stomach, spleen and liver. Through the disturbance of circulation, consequent on these conditions, ensues the discommoding of the heart. The danger, therefore, lies rather in the overfeeding than the underfeeding of cardiacs. I do not mean that there are no perils in undernourishment. Indeed, it is upon the healthy normal development of all parts of the body that we base a great part of our optimism as to the final overcoming of heart-disease in the young. We must feed often when we feed lightly; and we cannot lay sufficient emphasis on the beneficial properties of milk as the mildest and at the same time the most complete food. Speedy drinking must be avoided as well as frequent indulgence in iced beverages.

Cardiac disorders occur frequently from, or are augmented by, undiscovered or neglected difficulties with teeth and tonsils. These conditions should be remedied as soon as the doctor sees fit and improvement will almost invariably follow. We may add to these suggestions the general rules of care and cleanliness governing personal physical hygiene.

Let us now consider the dangers peculiar to children of school age who attempt, despite some cardiac disorder, to attend public school. The climbing of many flights of stairs, even when done slowly, is harmful. The attempt to run them with healthy members of the class has often been known to result fatally. The physical exercises of the other children, whether those ordered and supervised by the teacher, or those indulged in as play during recreation periods, are too strenuous for heart sufferers. So also are the fire drills, in which the element of excitement is added to already harmful exertion. Cold lunches are inadvisable fare for any child. Among this particular class of children, they need doubly to be avoided. The regular attendance at school, despite inclemency of weather, that is an integral part of the régime of our public schools, is harmful to cardiac children. The weather plays an important part in their physical condition, particularly in those suffering from some form of rheumatic infection. They should be kept at home whenever they may be subjected to cold or dampness. The question of the strain of frequent examinations on poorly balanced nervous systems has also been raised; and the worry and weariness experienced at such times is often harmful to diseased hearts. What then is the solution of these difficulties occurring unavoidably in all schools?

The answer lies not in the segregation of 2 or 3 out of a large class of healthy youngsters. Besides wounding the child's natural pride of emulation and setting him apart as one different from his fellows, this course tends to disrupt the unity of classroom procedure, and, by placing an added burden on the shoulders of the teacher, lessens her concentration on the arduous duties before her.

Nor does the answer lie in keeping the child out of school. No greater injustice could be done him. With certain exceptions, most of these children may look forward confidently to a long, if restricted, life. Why take from them that greatest of all privileges, the chance to become a useful member of the community? We have failed signally in our duty towards these children, if, through laziness or lack of thought and effort, we do not insist on the establishing of conditions that will be to them of mental, physical and moral benefit.

The ideal solution has been found in a class for cardiacs alone, now operating along public school lines, in connection with our institution and under the auspices of the Board of Health and the Board of Education.

All the pupils being sufferers from some form of heart disease, the general rules given above are carried out impartially. The class-room is light and airy. There are few stairs to climb. All exercise is graded according to the cardiac division in which the child is placed by his physican, for each pupil regularly attends the cardiac clinic of our hospital. A trained nurse takes every child's temperature, pulse and respiration twice daily. At the end of the week, or sooner if need arises, the record of these is sent to the social service nurse of the cardiac clinic, who submits it, with any other significant data, on the day of the children's attendance in the dispensary. Steamer chairs on the roof, each equipped with its own sleeping bag, give the pupils the needed quota of rest and air. Recreation teachers keep them on this roof during the greater part of the afternoon, supervising their exercise and suggesting new forms of harmless play. A hot meal is served in the middle of the day, costing the nominal amount of a few cents or given free to those who cannot pay. A bus calls for most of the children and takes them to and from school. Those for whom the doctor has prescribed moderate exercise are allowed to walk home, if the distance is not too great, proceeding slowly in charge of the recreation teachers.

This school serves many purposes. The children enjoy the stimulating companionship of others their own age without being subjected to the dangers of the ordinary public schools or the loneliness of their own homes. They are kept off the streets, and away from the harmful over-exertion attendant on an indiscriminate choice of playmates. They are well fed, carefully instructed, and taught *how* to play, under the supervision of nurses and teachers.

The need is urgent for more of these schools, many in each district. Ours has long been full; applicants are turned away daily.

We have here one of the finest forms of social service. Its cooperation with organizations along totally different lines is of benefit to the community, with advantage accruing to all concerned. The Board of Health profits in that it can see the carrying out of hygienic and therapeutic measures in a field that has long needed them. The Board of Education adds to its enrollment of public school children. The social service department benefits through its contact with forces that, once interested, will again come to the fore; and the children, for whom all has been planned and carried out—surely they are the greatest gainers of all!

I have barely touched on the possibilities of social service as evidenced in the limited sphere of our own activities. I have only mentioned our cardiac clinic, whose efficient management by doctors, nurses and volunteer workers has resulted in the steady attendance and warm interest of all its patients. I have totally omitted the question of recuperative country care provided for cardiacs in the splendid convalescent homes reserved for this purpose. Nor have I touched on the educational work constantly carried on in the homes by visiting nurses. The tremendous subject of the vocational training of cardiacs so that they may become skilled workers in trades that will not prove harmful to them, I omit with intention. I have dealt chiefly with the question of social service as applied to the heart disease of children. It is to the years that follow the period of education that the vocational instruction should be dedicated.

The subject is too fascinating, and, in its newness and limitless possibilities, too full of by-paths to be handled adequately in a few words. There is one point that I would like to leave in your minds, a point proved to us again and again since the establishing of our social service department. Cardiac work *must* be followed by the after-care of social service if the patient is to reap full benefit of medical skill, and if the doctor is to feel that his work has not been left uncompleted.

The way of the pioneer, if beset with many difficulties, has at least the interest of unexplored territory. We are given the chance of being forerunners in a splendid movement. Social service, in the restricted sense with which we use the term, is a comparatively new development; especially in its work with heart disease it has as yet followed few of its glowing opportunities. The start has been made, however, and along therapeutic, educative and vocational lines, has the way been pointed out. Ours it is to follow.

DIAGNOSIS OF PULMONARY TUBERCULOSIS IN CHILDREN (Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam, April 22, 1922). De Lange deplores the too frequent tendency of practitioners to decide that in a child, with a tuberculous lesion anywhere, a process in the lung must necessarily be of a tuberculous nature. Even chronic lung processes with negative tuberculin tests are regarded as tuberculous, when in fact there is merely some infiltration and tendency to bronchiectasia. As the lung clears up in time, the case is reported as an example of a brilliant cure under the treatment that had happened to be used at the time. It is a grave blunder to send such children to a tuberculosis sanatorium. A child under 8 with physical findings of such extent would rapidly succumb, if they were actually of a tuberculous nature. There may be a small tuberculous focus with an encircling nonspecific infiltration. The French "splénopneumonie" is one form of these chronic nontuberculous affections of the lung in children. A chronic pneumonia may entail retraction, and in asthenic children the right subclavicular fossa is often sunken in. Apical processes are rare in children, while a faulty attitude may induce deceptive physical findings. The difference in the size of the two lungs may also prove misleading. Extensive chronic lung processes in children under 8, which clear up or remain stationary, are not pulmonary tuberculosis. She describes several typical cases in which only the ultimate recovery corrected the diagnosis.—*Journal A. M. A.*

RATIONAL MANAGEMENT OF THE UNDER-NOURISHED CHILD.*

By Frank vander Bogert, M.D.

Schenectady, N. Y.

Those of us who are interested in rational diet have a hard row to hoe. Dietetics, especially in childhood, is looked upon as a fad, an outcome of modern scientific enthusiasm. But dietetics is not a new department of medicine. J. J. Walsh in his Medieval Medicine quotes several maxims from "Regimen Sanitatis" as instances of common sense with regard to diet of the school of Salerno formally organized in the tenth century. Two or three of these might well bear repeating here in refutation of the argument that diet is a modern fad.

"Doctors should thus their patients' food revise,
What is it? When the meal? And what its size?
How often? Where? Lest by some sad mistake,
Ill-sorted things should meet and trouble make."

And again, with regard to the interval between meals:

"Eat not again till thou dost certain feel
Thy stomach freed of all its previous meal.
This mayst thou know from hunger's teasing call,
Or mouth that waters, surest sign of all."

Unfortunately we know that hunger's teasing call is not always reliable, and that a watering mouth may be due to indigestion, but the advice embodied in the first 2 lines is good and in full accord with modern views.

If it were always possible to distinguish between real appetite and tissue hunger, our feeding problems in pediatrics would be simple. Unfortunately, however, hunger is often evidence of mal-assimilation and an indication for reduction of food rather than an increase, and the craving for certain articles of food can no more be relied upon as an evidence of a need for those foods in the development of tissue in childhood than is the craving for alcohol, opium or tobacco in adult life.

---

* Read, by invitation, at the Annual Meeting of the Fulton County Medical Society, Gloversville, N. Y., December, 1920.

We are hearing a great deal about the undernourished child, and the treatment of this condition must be considered one of the most important problems in pediatrics today. In time, prophylaxis through rational diet in the earlier years, it may be hoped, will eliminate the condition but we must meet the problem as it stands at present and endeavor to nourish and develop that enormous percentage of undernourished and underdeveloped children met in school and medical work.

In order to deal intelligently with these cases the fact must be appreciated, that from an etiological standpoint these cases fall into 2 groups: those due to actual starvation, an inability to obtain sufficient food of proper composition, vitamine content, etc., and those due to inability to digest and assimilate.

The former group, I believe to be in the very small minority after the first year of life before which time we of course see many cases of rickets and scurvy which are directly attributable to lack of live fresh foods, but even here the underlying factor is ignorance rather than poverty.

Parents can, with few exceptions, supply the deficiency if simply taught how to do it. With older children upon a mixed diet actual starvation, in the common sense of the term, is, in this country, probably exceedingly rare.

The latter group includes almost certainly the vast majority of undernourished children discovered during school medical examinations and of those referred to us for treatment whether of school age or younger. It is this group, their prevention and treatment, which I wish to discuss.

The following history of family conditions described in "Children of the Kentucky Coal Fields" illustrates this point:

One family of man, wife and 6 children, ranging in age from 18 months to 12 years, were found living in poverty and filth. The children looked sickly and underfed. All had badly decayed teeth. The boys of 12 and 8 were both in the primer class, the boy of 10 in the 1st grade, and the 6 year old boy had never attended school. The mother explained that they did not go to school much because they could not buy clothes. The man earned, she thought, over $100 a month and she earned $4 a week washing. The husband estimated that it cost $100 a month for food alone. Rent was $6, and of clothes, furniture and extras they bought practically none. Their daily food budget was as follows:

Lard	$ .25
Eggs	.50
Ham, Steak or Pork Chops	.65
Meal	.10
Sugar	.05
Potatoes	.28
Beans	.25
Salt Pork	.26
Bread	.10
Buttermilk	.13
Canned milk	.20
Cakes	.13
Candy	.05
Rice	.05
	$3.00 daily,
	$90.00 monthly.

They had eggs or meat regularly for breakfast. If eggs, they used from a dozen to a dozen and a half at a time. In addition they consumed from 50 to 75 cents' worth of meat a day, besides the salt pork which was eaten with the daily allotment of 2 pounds of beans. They used no butter but spent 25 cents a day for lard, no sweet milk, but buttermilk and canned milk, no fruit, but almost 20 cents' worth of cakes and candy a day. They kept no livestock, planted no garden, did no canning. An analysis of this diet would probably show that it was enormously high in protein, as shown in the lavish consumption of meat, beans, eggs, and in starch and fats, evidenced in the use of potatoes, meal, flour, eggs, and in salt pork in large quantities. It was seriously lacking in minerals, to be had in fruits and vegetables, and in the essential vitamines to be had in fresh milk and butter. The family, while spending perhaps twice as much as necessary to meet their dietetic needs, was starving for the foods their diet did not include.

For generations raisers of domestic animals and of wild animals in captivity have realized the importance of regular, carefully adjusted meals to proper physical development. Horses are given a definite quantity of oats and hay at definite periods.

Pedigreed dogs are fed with the utmost regularity and care. Animal trainers know that irregular feeding, feeding between meals, and the giving of indigestible irritating foods cause their charges to sicken and die, yet our children, who must under present conditions of civilization be looked upon as young animals in captivity, since they are as dependent upon their parents or guardians as the animal upon his keeper, are given what they want when they want it.

Just so long as we countenance haphazard methods of rearing the human young so long must we expect to develop a poorly nourished race.

Infant feeding is pretty well standardized, the importance of its careful supervision is appreciated, but unfortunately there is still a tendency for the physician to feel that his responsibility ceases at the end of the first year. Proper physical development unquestionably depends almost entirely upon development and protection of the digestive tract and digestive development depends upon judicious assignment of work to do. The effect of prolonged nursing and long continued bottle feeding is a pretty illustration of the effect of pampering the digestive organs. These children do not develop normally and lack resistance to disease. It is true that primitive races and animals in the wild nurse their young for long periods. We have seen pictures of children standing at the breast and I have been told of 2 instances in widely distant portions of the world of children sucking between the puffs of cigarettes and cigars. These savages and wild animals, however, were taught during the nursing period to shift for themselves and their digestive organs were early but gradually brought to their task. Roth in his "Aborigines of Tasmania" instances a baby under one year old eating a kangaroo rat. Young lion cubs gnaw bones while still at the breast. Young camels crop before weaning.

It seems to be pretty well established that under present conditions of civilization one year at the breast should be considered the limit and the bottle should be looked upon as a substitute for the breast where necessary and withdrawn at the same time. Sim Wallace, lecturer on dental surgery at the London Hospital, in a most interesting little book on child welfare, condemns as pernicious present accepted ideas of weaning, and says that when the time comes for supplementing milk with other articles of diet a solid piece of food which the infant can partly take into its mouth should be given to the child. He recommends breads and crust with butter as early as the ninth month, provided it is not soaked in milk and says that the further introduction of solid foods into the child's dietary, such as boiled fish, meat, etc., need not be referred to, for unless such foods are deliberately finely ground, pounded or minced, and unless the physiological instincts of the infant have been perverted by compelling it to subsist for a long time on pappy foods, it naturally takes to solid foods, sucks them, insalivates them, and incorporates them with mucus, so that they arrive in the stomach in exactly that state which is best calculated to promote their digestion. The experiments of Dr. F. D. Boyd, he says, seem to prove most conclusively that the presenting of food in a sloppy form interfered in a most marked way with normal digestion.

This we must admit to be rather radical but no doubt the tendency to give sloppy food too long has a real bearing upon the whole subject of mal-nutrition. I have personally been advocating solids much earlier than formerly and feel them to be of real value because of the effort required to masticate.

From the first year on the essentials of management should be the following: A definite number of meals daily given with absolute regularity as to time; to establish a regular digestive habit, and separated by an interval long enough to insure complete digestion and the establishment of an appetite. Absolute abstinance from food between meals, nothing but water being allowed. The diet should be a mixed one, specified quantities of individual foods with enough green vegetables to stimulate peristalsis and thereby insure regularity of the bowels and avoidance of stagnation, the factor in the production of fermentation products. Mastication should be encouraged.

As to the feeding interval, the only way to establish a normal appetite is to keep food away until real hunger manifests itself. If the feeding interval has been long enough we can feel assured that the hunger is real. Provided a reasonable meal has been given, a desire for more food within the normal emptying time of the stomach certainly means poor assimilation. Three meals a day are probably enough after the child is 15 months old. It is common practice to treat a failing appetite with tonics. Wallace says that he has practically never seen an emaciated child with an unhygienic digestive tract treated by keeping food away from it and suggests the most obvious fact that the administration of tonics and digestive stimulants generally increases appetite, tending to over-eating and thereby to derange a weakened digestion and thus induce further malhygiene, while the administration of antiseptics is an admission of the existence of an unhygienic state without attempting to remove the cause.

How often we see a mother tempting a child who does not want to eat, by varying the constituents and preparation of the meal when if left alone he would soon be begging for food. If a horse refuses to eat its oats we clean out his manger and let him go until the next meal is due; if a child refuses his oatmeal we try to force it down his throat or encourage him to take what he instinctively knows will increase his unhappiness, by the addition of sugar. A hungry child does not need sugar on his cereal. Our patients often beg for variety in their children's menus. Variety is not objectionable but not essential. Animals eat the same food year after year. There is a race of people in the South Sea Islands who live continuously on a single article of diet.

A working knowledge of caloric values is advantageous, but as Jacobi once said, "you can satisfactorily feed more babies with common sense than by mathematics." If a child eats more than his father it can be safely assumed that he is getting more than he needs and his meals should be adjusted accordingly. The dangers of between meals feeding are too obvious to require much discussion. I have found, however, in taking dietetic histories, that it is very necessary to go minutely into detail as to this phase. Parents will deny that their children are getting more than the regular meals but on close questioning admit the eating of bread, apples, etc., or an occasional glass of milk.

Satisfactory mastication can only be insured in most cases by education from early time but unquestionably much can be done by administering the food in such form as to necessitate some working about in the mouth before swallowing.

Most of the undernourished children which we see later in life are undoubtedly cases of gastrointestinal disorder brought about by neglect of the rules above mentioned. These children come to us exhibiting one or more of 3 distinct groups of symptoms: First. Symptoms due to interference with digestion and assimilation of food, including poor physical development, muscular weakness, wasting and anemia. Second. Those attributable to the diseased condition of the digestive tract, including loss or perversion of appetite, constipation or diarrhea, or a condition of alternating constipation with diarrhea, and so-called bilious attacks occurring at longer or shorter intervals. As objective symptoms in this group may be noted the gray, thinly-coated, shiny or slimy tongue, or where gastric indigestion predominates, the so-called geographical or mapped tongue, attributed by Eustace Smith to gastric instability brought about by the fermentation products of cooked sugar in the food, together with foul breath, abdominal distention and flatulency. Third. Symptoms referable to the toxemia, most of the functional nervous diseases of children falling into this group.

A study of between 50 and 60 cases which I analyzed some years ago gave the following toxemic symptoms: Fever, usually not high except during the acute outbreaks. Headaches. Grinding of the teeth and picking at the nose, the symptoms upon which lay-diagnoses of worms are made. Skin eruptions. Nervous irritability. Muscular incoordination and tendency to fall upon slight provocation. Disturbed sleep, including sleep-talking and night terrors and a tendency to awake unrefreshed in the morning. Mental dullness, and an inability to concentrate the attention. Attacks of pallor, which may at times simulate petit-mal, and actual convulsions.

A typical case of gastrointestinal indigestion presents the following picture: The child's complexion is sallow, with dark rings about the eyes; he looks, as the English express it, "livery"; the body is wasted and under-developed; the belly, large; the extremities, small; he is anemic; the tongue is usually coated lightly and often slimy from a deposit of mucus over the surface, giving the appearance described as characteristic of mucus disease. The mental condition of the patient is dull or disinterested, or the general manner may give the impression of unhappiness or discontent. He is irritable, flies off into fits of temper or cries upon slight provocation, suffers from day and night terrors, and may be a sleep-walker or sleep-talker. Headaches are common, and various skin lesions appear from time to time, principally urticarias and eczemas. Jacobi says that in cases of erythema, which are universal or nearly so, the condition of the urine, containing products of intestinal fermentation, may be utilized in differentiating from scarlet fever, measles and rubella. Muscular incoordination, due in part to the general muscular weakness and in part, undoubtedly, to the inability on the part of the poisoned mind to concentrate itself upon muscular action, is a prominent symptom. These children stumble and fall without any apparent cause; speech defects are occasionally noted.

To treat such a case by forced feeding as is advocated today, to urge such a child to consume a quart of milk a day in addition to what has already caused his discomfort seems to me to be bad medical practice.

A broader conception of the term undernourishment must be had in order to combat this condition which must be conceded to be a very real menace. Gain in weight under forced feeding may be compared to relief of pain by opiates. The condensed milk baby is a pretty illustration of so false a standard.

Physical development cannot be estimated by the size of a muscle or by the amount of subcutaneous fat that we are able to deposit but, as much, by a general feeling of well being, a happy disposition and a normal appetite, all of which indicate a state of normal development and function of the body organs. Primarily, in any animal, nutrition depends upon the state of the digestive tract. It is our duty then to protect and to develop these organs from early infancy.

111 *Union Street.*

ACUTE PHLEBITIS IN CHILDREN (Archivos Latino-Amer. de Pediatría, Buenos Aires, Nov.-Dec., 1921). Morquio's analysis of the literature confirms the exceptional character of acute phlebitis in the limbs in children. He has never encountered it himself but twice. In both cases the phlebitis of the left femoral vein had followed typhoid, in girls of 9 and 10. The interval had been six weeks in one case, and the typhoid nature of the sickness had not been recognized. The symptoms had been those of scarlet fever. But the phlebitis was unmistakably a manifestation of typhoid septicemia. The phlebitis ran a two or four months' course to final recovery in the two cases.—*Journal A. M. A.*

AN IMPROVED WEIGHT CHART FOR INFANTS IN THE FIRST YEAR.*

By Harold K. Faber, M.D.

San Francisco

In a recent paper in this journal (Faber, H. K. A Study of the Growth of Infants in San Francisco, with a New Form of Weight Chart. Archives of Pediatrics, 1920, 37, 244) a chart was shown giving the maximum, mean and minimum weight curves, during the first year of a large series of normal babies. This chart, containing as it did, 6 different curves, appeared to be too complex for everyday use in private practice and in the clinic. A simplified chart was accordingly constructed, based on the same data, which has been proved to be satisfactory by about 6 months use in the Stanford Children's Clinic, in the Children's Ward of Lane Hospital and in private practice and has recently been adopted by the San Francisco Board of Health for its Welfare Centers.

The purpose of the chart was to avoid the evils of the common single-line chart and still to preserve a legitimate standard of comparison, such as is lost when no growth line at all is shown. The proper solution seemed to be to present a standard maximum and a standard minimum weight for normal, full-term babies. The setting of such points is of course a difficult and somewhat inexact affair. By plotting all the weights which deviated considerably from the mean, two smooth "range" curves were found which included 99.6 per cent. of the observed weights of babies in the series. Of the remaining 0.4 per cent., about ⅓ fell above the maximum line and about ⅔ below the minimum. For practical purposes it seemed likely that the range so set would be sufficiently inclusive, and this has in fact proved to be the case.

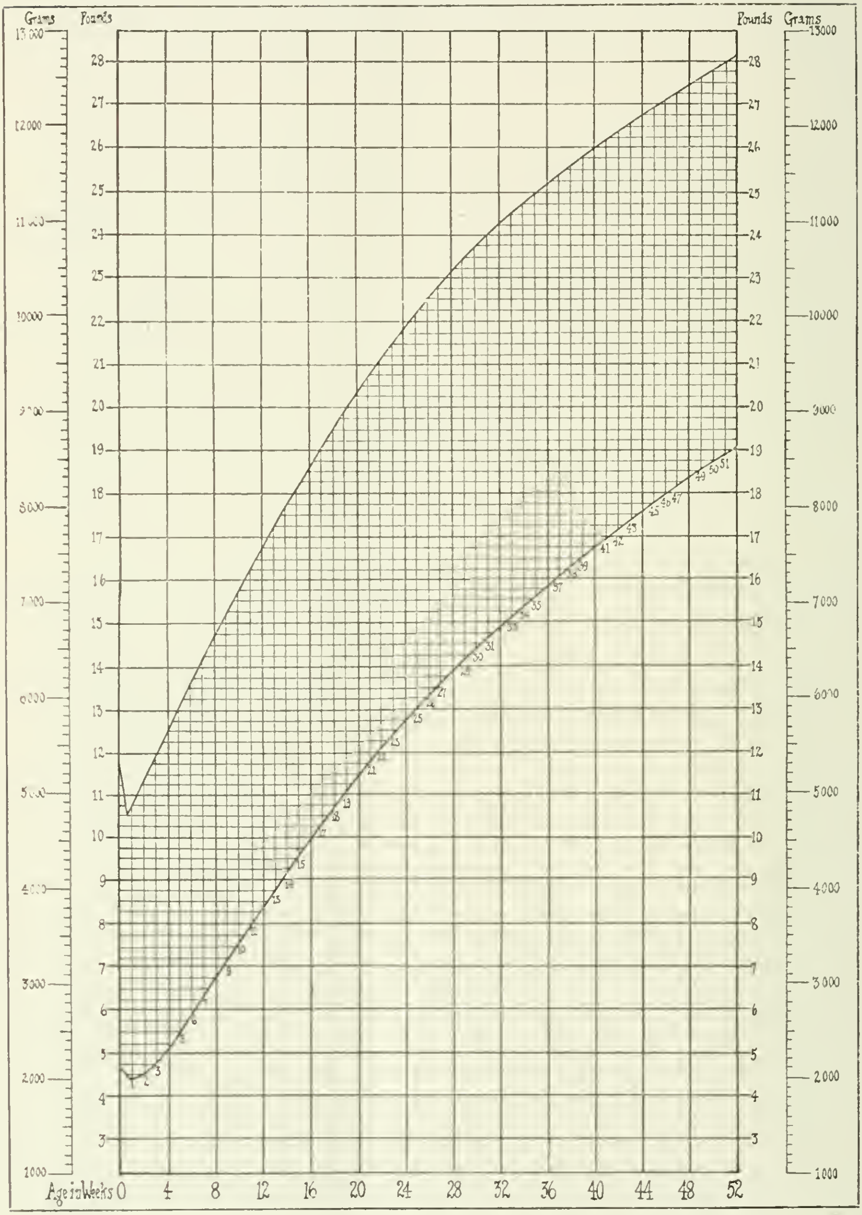
As will be seen from the accompanying plate, the intervals for the chart as a whole are 4 weeks in the abscissae and one pound in the ordinates. By subdividing these intervals within the range curves into one week and 4 ounce intervals, a visual contrast has been obtained which has been found time-saving in entering weights. The same end has been served by placing the week fig-

---

* From the Subdivision of Pediatrics, Stanford University Medical School, San Francisco, California.

WEIGHT CHART

STANFORD UNIVERSITY MEDICAL SCHOOL—SUBDIVISION OF PEDIATRICS



Name Born

ures (excepting the multiples of four) directly under the minimum line instead of at the bottom of the page. The metric scale at both sides of the chart permits the use of a straight edge in placing metric weights accurately on the chart.

As regards the maximum and minimum weights at one year, both may perhaps be thought somewhat too high. We have, however, seen a few babies without signs of pathological adiposity or other disease who have exceeded the maximum during the twelfth month and it has not been our experience that normal, full-term babies, whose health has been continuously good, weigh less than 19 pounds at the end of the first year. The maximum birth weight of the chart is not, of course, intended to cover "record" cases.

Finally, it has been found decidedly advantageous to have 2 standards of growth for comparison; one, for large, rapidly growing babies, the other for the smaller babies who as a rule do not gain so fast. The use of the chart has demonstrated to us that in the individual case the growth curve in health runs approximately parallel to the nearest standard curve, maximum or minimum. This point is easily understood by the mother, who, moreover, is usually satisfied if the weight of her baby falls between the 2 curves and shows a consistent gain.

JAUNDICE IN THE NEW-BORN (Semana Médica, Buenos Aires, Nov. 10, 1921). F. A. Deluca found evidences of laceration of the dura mater and of more or less profuse meningeal hemorrhage in 36 per cent. of the 554 infant cadavers examined since 1907. In 34 of the 201 cases delivery had been supposedly normal; in 15 the birth had been premature; in 23 there had been manual traction with breech presentation. The meningeal hemorrhage may well explain the jaundice of the newly born child in some cases. Jaundice may thus sometimes be regarded as a sign or symptom of meningeal hemorrhage. In 5 cases the jaundice developed the day after birth and the fontanels bulged. Lumbar puncture released a bloody fluid, and the child had convulsions later and died the fifth day, or else the jaundice did not develop till the sixth day and the child died the seventh. Only 2 of the children in this group recovered. He is investigating now to determine whether it is possible for meningeal hemorrhage to occur without jaundice.—*Journal A. M. A.*

DEPARTMENT OF ABSTRACTS

Conducted by
Wm. Henry Donnelly, M.D., Brooklyn, N. Y.

Cooke, J. V.: Transmission of Complement Fixation Substances from Mother to Child. (American Review of Tuberculosis, April, 1922, p. 127.)

The summary of the writer's conclusions are as follows: Complement fixing antibodies present in the mother's serum may be transmitted to her offspring and persist in the infant's blood for a certain number of weeks. In most instances they have disappeared by the end of the second month. When a young infant's blood gives a positive complement fixation test for tuberculosis, this reaction is not an evidence of tuberculous infection in the infant, since these fixing substances are not formed during the first year of life. The presence of such fixation is only noted in young infants when transferred from the mother. The transmission of complement fixing antibodies in tuberculosis is not accompanied by transmission of substances which render the skin sensitive to tuberculin. W. H. D.

Sidlick, D. M., and Knowles, Frank Crozer: The Value of Protein Sensitization Tests Employed in Eczema and Urticiaria of Childhood. (American Journal of Diseases of Children, April, 1922, p. 316.)

Sidlick and Knowles prefer the intracutaneous method, dissolving the protein test substance in physiological saline, with the usual amount of phenol added as a preservative. After cleansing the skin, 0.05 c.c. was injected intracutaneously in the arm; a successful injection is followed immediately by the appearance of a raised white spot resembling a wheal. The cutaneous reaction may be immediate or delayed for 48 hours. The tests proved of value in ascertaining the etiological factor in a fair number of cases of eczema and papular urticaria; however, the elimination of specific offending proteins will not effect a cure in all cases of eczema or urticaria in children. To be of value, the test must be at least 2 plus, that is, it must be twice as large as the control and surrounded by an erythema. It is to be assumed that, by correcting the gastrointestinal abnormalities, an increase in the number of clinical cures is certain of attainment. W. H. D.

BARTLETT, FREDERICK: INDICATIONS FOR THE REMOVAL OF THE SPLEEN IN INFANTS AND CHILDREN. (American Journal of Diseases of Children, April, 1922, p. 289.)

Bartlett has attempted to collect all reports of splenectomies done on children under 14 years of age, and has found 51 cases. Three cases are reported by the writer as an addition to the literature, and the following conclusions are set forth: It is desirable to remove the spleen in the early stages of any pathological process for which splenectomy is indicated. Hemolytic jaundice presents the most favorable condition for cure by splenectomy; Banti's disease and Gaucher's disease represent pathologic processes for which splenectomy may relieve symptoms and prolong life. Von Jaksch's disease is probably not an independent condition. Indications for removal of the spleen depend on certain criteria, not on the making of a definite diagnosis. These criteria are splenomegaly, secondary anemia, and the failure of repeated blood transfusions to determine any improvement in the anemia and general condition of the patient. W. H. D.

BOYD, GLADYS: NEPHRITIS IN CHILDREN. (American Journal of Diseases of Children, May, 1922, p. 375.)

The cases of acute nephritis in childhood are divided into those which apparently completely recover in from 3 to 5 weeks, and those in which recovery begins and then remains stationary. Hematuria, as evidenced by the microscopical finding of blood in the urine, occurred in all cases, and all degrees of edema were encountered. In no case with general anasarca was the renal function returned to normal, and most cases ended fatally. Vomiting of a severe and persistent type was the most frequent clinical manifestation of uremia. This may be attributed to acidosis but it was not accompanied by other manifestations of this condition, and was accompanied by definite increase of nitrogenous elements in the blood. Alkali therapy was of no avail in these cases. Functional renal tests were the most reliable guide both as to treatment and prognosis. Infection was the most important etiologic factor in a series of 26 cases. The cases were put to bed and kept there until all evidences of acute nephritis had disappeared. The diet was restricted to 1000 or 1600 c.c. of milk depending on the age of the child. A more liberal diet consisting at first of cereals and milk puddings was given as soon as retained waste products were excreted; protein was gradually added until a maximum of 40 to 50 gm. was given when the patient was clinically cured. The diet was kept salt free throughout the stay in the hospital. Calcium chloride or lactate, in 5 gm. doses, 4 times daily, was given and had a definite effect on clearing up edema. Hot lumbar stupes were found as efficient as packs and less disturbing to the patient. W. H. D.

DAVIES, G. R.: PROPHYLACTIC AND THERAPEUTIC VALUE OF PERTUSSIS VACCINE. (American Journal of Diseases of Children, May, 1922, p. 423.)

Of 176 children exposed to the disease in an institution, 33 developed pertussis and were removed from the main building. Afterwards only 4 additional cases developed in the remaining 143 children who were given prophylactic doses of pertussis vaccine. In the active cases it seemed that the duration of the disease was shortened by the vaccine; there was a marked effect on whooping, vomiting and coughing. The initial dose of the vaccine was 500 million units and the maximum dose was 3000 million given at intervals of 3 days. W. H. D.

HESS, ALFRED F., AND UNGER, LESTER J.: USE OF THE CARBON ARC LIGHT IN THE PREVENTION AND CURE OF RICKETS. (Journal A. M. A., May 27, 1922, p. 1596.)

Hess and Unger report excellent results from the use of the carbon arc lamp in rickets. The lamp used was similar to, but smaller than, those employed in taking motion pictures. The carbons were "white flame" and the current was 30 amperes and 110 volts. A coarse meshed wire screen was placed in front of the lamp and the infants, entirely naked, were placed at a distance of from 3 to 9 feet from the lamp, with the eyes protected by goggles or other covering. There is no tendency to either tanning of the skin or superficial burns, and the length of time of treatment was from one quarter hour to two hours. The writers feel that there will be clinics in the near future for the use of this light treatment and the supplying of cod-liver oil. In such clinics carbon lamps may be used in the winter and spring months for protective therapy; and the treatment would be of especial value in negro infants whose skin tends to filter out the essential rays of the sun. Clinical findings, in the series of 11 rachitic infants so treated, were checked up by x-ray examinations and inorganic phosphate blood tests. W. H. D.

LEARY, TIMOTHY: DRIED MILK. (Boston Medical and Surgical Journal, May 4, 1922, p. 591.)

Leary believes that little argument should be needed to show the advantages which arise from the elimination of water from milk as water is what gives milk its perishable quality. Hygienically, dry milk would eliminate the milk borne epidemic; economically drying milk does away with all the emergency proceedings which are necessary for the handling of liquid milk. An important drawback to the universal use of dry milk is its price, which should be corrected with wider use and the passing of the need for introductory advertising. The physician should know all of the facts regarding such an important food as milk, and, while advocating drying as a method of preserving milk, he should remember the limitations of the process, and should not recommend dry milk as an exclusive food for the nursling without the addition of an antiscorbutic. He should further remember that once water is added, and the milk reconstructed, there is produced a culture medium as good as fresh milk, and that dry milk should be prepared only at the moment when it is needed and with rigid precautions as to cleanliness. W. H. D.

MCCULLOCH, HUGH AND RUPE, WAYNE A.: THE TOLERANCE OF CHILDREN FOR DIGITALIS. (Southern Medical Journal, May, 1922, p. 381.)

The writers believe that the method of administration of massive doses of digitalis should be the same in the child as in the adult. The use of massive doses in children is entirely practicable and under proper supervision possesses no source of danger.

The amount of digitalis necessary to produce clinical improvement coincides with the amount necessary to produce vomiting and a fall in heart rate. These 2 phenomena may be taken as criteria that an optimum therapeutic affect has been obtained. Children with heart disease require an amount of digitalis per kilo of body weight, which is about 50 per cent. greater than would be required for adults. There are 2 indications for the use of digitalis in children: first, those who are suffering from heart disease and who are in a chronic state of cardiac failure; second, those who have a regular rapid heart rate which cannot be slowed by other measures. Massive doses of digitalis are contraindicated in 2 groups of children with heart disease: first, those who have an acute infection or toxic myocarditis; second, those who are suffering from acute cardiac failure, with hearts that are overloaded.

W. H. D.

NOBECOURT, PROF.: TREATMENT OF SUBACUTE OR CHRONIC TUBERCULOUS PERITONITIS IN THE CHILD. (La Pediatrie Pratique, April 25, 1922, p. 103.)

Professor Nobecourt believes that the fundamental treatment of tuberculous peritonitis consists in rest in bed, careful diet, outdoor air, sea water baths and heliotherapy. Surgical procedures are necessary, or advisable, in only a very small minority of cases. Paracentesis of the abdomen is often of value followed by the injection of air or of nitrogen. There is nothing special in the drug treatment, which includes lime salts, phosphoorganic acids, cod-liver oil, and, when the digestion permits, iodine.

W. H. D.

HAYS, HAROLD: PRECAUTIONS TO BE TAKEN BEFORE TONSILLECTOMY. (Medical Times, May, 1922, p. 137.)

Hays believes that, while the coagulation time test of the blood is not always consistent, still it should always be done, to feel assured that, if the time is within the normal limit, there is practically no danger from hemorrhage at the time of operation. On the contrary, if the coagulation time is prolonged, it is easy to delay the operation long enough to bring the time up to the correct limit. The simplest way of doing this test is to prick the finger and compare the coagulation time with that of a person whose time is normal. The only exact coagulation time test which can be made is to withdraw the blood as for the Wassermann. Hays is in the habit of doing coagulation tests on every patient before tonsillectomy, and, as an additional precaution, regardless of whether the coagulation time is normal or not, every child is given 10 grains of calcium lactate, 3 times a day for 3 days before operation. It has seemed that the calcium lactate has had a beneficial effect on the bleeding after operation, and as yet no serious hemorrhage has been encountered. W. H. D.

HESS, JULIUS H., MOORE, JOSIAH J. AND CALVIN, JOSEPH K.: EXPERIMENTAL STUDIES WITH PROPRIETARY VITAMINE PRODUCTS. (Journal A. M. A., May 13, 1922, p. 1441.)

These experiments showed that the aging and process of manufacture did not cause as much deterioration of the antineuritic as of the antiscorbutic vitamines. It would seem that the claim that one or all of the known vitamines can be satisfactorily prepared for dispensing in a satisfactory form which will not be affected by aging, drying, and oxidation, is open to great question. It is becoming more firmly fixed in the minds of investigators that the best method of obtaining vitamines is through a proper selection of foods and that vitamines should be obtained from the grocery and market and not from the drug store. W. H. D.

CARONIA G. AND AURECCHIO L.: ON THE PRESENCE OF TYPHOID AND PARATYPHOID BACILLI IN THE CEREBROSPINAL FLUID. (La Pediatria, April 15, 1922, p. 337.)

Caronia and Aurecchio state that the typhoid bacillus is found in the cerebrospinal fluid in from 93 to 94 per cent. of children with typhoid. There is no relation between the finding of the bacilli in the fluid and the period or form of the disease. This fact is of importance as verifying the concept that typhoid is a generalized infection, and as explaining the method of production of localized infection in typhoid without the intervention of either other constitutional elements or bacteria. From the standpoint of diagnosis, the relative facility, rapidity and constancy of the test would seem to make it a valuable addition to our armamentarium. W. H. D.

TUCKER, JOHN: IMMEDIATE RECOVERY FROM DIABETES INSIPIDUS AFTER LUMBAR PUNCTURE. (American Journal of the Medical Sciences, May, 1922, p. 668.)

Tucker's case was in an adult but the procedure should be of value in this condition in children as well. One lumbar puncture gave immediate relief which had persisted about 6 months at the last examination. The writer's conclusions are that diabetes insipidus may result from not only destructive lesions of the pituitary gland but from any cause which may obstruct the flow of the normal secretion. Such an obstruction may result from a transient edema of the pituitary gland, or from an inflammation with a resultant plastic exudate, or it may result from intrapituitary conditions, such as increased intracranial pressure from any cause. The withdrawal of spinal fluid, whether under high or low pressure, tends to relieve this pressure and relieve the obstruction. The case reported indicates that any case of the disease should be given the advantage of the possibility of early relief by lumbar puncture. W. H. D.

MARFAN, A. B. AND DORLENCOURT H.: EXHALATION OF WATERY VAPOR FROM THE LUNGS OF THE NORMAL INFANT AND FROM THE INFANT WITH DIARRHEA. (Le Nourrisson, May, 1922, p. 173.)

Researches by the authors established the fact that, in cholera infantum, the exhalation of watery vapor by the lungs, in terms of relation to kilo of body weight, is increased by more than one third. Further, in common diarrheas without toxic or infectious symptoms, this exhalation is diminished by more than one half. A normal child of 5 kilogrammes weight, for example, exhales 22.89 grammes of watery vapor in 24 hours; in choleriform diarrhea, it exhales 31.25 grammes; in ordinary diarrhea, it exhales 9.5 grammes. W. H. D.

DAMADE, RENE: SEVERE URTICIARIA FROM LAMB'S WOOL MATTRESS. (Journal de Medicine de Bordeaux, February 25, 1922, p. 111.)

Damade's patient was subject to severe itching and persistent attacks of urticaria which only occurred during visits to the family country home. After all dietic causes were ruled out, the cause was traced to a mattress stuffed with lamb's wool and the attacks never recurred after the mattress was disposed of.

W. H. D.

MALLIE, HENRY: NEW TREATMENT FOR MUMPS. (Journal de Medicine de Bordeaux, January 10, 1922, p. 12.)

Mallie reports excellent results with the curative use of antidiphtheritic serum in mumps; the orchitic and other complications were especially beneficially influenced. The prophylactic efficacy has as yet not been proven, and the figures vary so much as to be unreliable. This method of treatment was first recommended by Salvaneschi in 1917, and later elaborated by Bonnamour and Bardin in 1918 and 1920. W. H. D.

HARPER, W. F.: ACUTE INTUSSUSCEPTION. (Boston Medical and Surgical Journal, May 25, 1922, p. 700.)

Harper reviews the literature and finds a preponderance of males over females (about 65 per cent. males) in the occurrence of the condition. That it is really a disease of infancy is shown by the fact that of 112 cases treated at the Children's Hospital in Boston since 1911, 99 cases or 88.3 per cent. were under 2 years of age. Further, between 90 and 95 per cent. of the acute intussusceptions were either ileo-colic or ileo-cecal. Uniformity of symptoms is extraordinary, with attacks of pain, pallor, vomiting, and with the passage, in 98 per cent. of all cases, of blood by rectum in from 2 to 12 hours. The mass can nearly always be felt by abdominal palpation, and only in rare cases can it be felt by rectum when not made out abdominally. In the cases in this paper from the Children's Hospital the symptoms were present in the following order: (1) Recurring attacks of pain associated with pallor, cold sweat, and reflex nausea. (2) Mucus, blood stained mucus, and blood in the stools. (3) Obstructive vomiting. (4) Toxemia due to obstruction. The mortality in the 112 cases was 39.2 per cent., and the prime factor in the mortality is the length of history before operation. The conclusion is, therefore, that it lies in the hands of the practitioner to reduce the mortality from intussusception. W. H. D.

FELDMAN, W. M.: IMPORTANCE OF A STUDY OF THE PHYSIOLOGY OF EARLY LIFE. (The Child, May, 1922, p. 234.)

Feldman emphatically states that a general training in physiology is not sufficient to make a medical man appreciate the physiological requirements and pathological peculiarities of the child. Anatomically, the head, spine, thorax, pelvis and limbs of the child show macroscopic, microscopic, chemical and physical differences from those of the adult, so that the child is not to be considered as a "miniature" adult but rather as an "immature" adult. Pathologically, disease and lesions in early life differ in character and distribution from those of the adult, e. g.: rickets occurs only during infancy, and tuberculosis attacks the apex of the lung in the adult, and the bones, joints and glands of the child. Clinically, pyrexia, vomiting and convulsions have not the same significance in the infant and adult; Cheyne-Stokes breathing, Babinkski's sign or leucocytosis must not be accorded the same importance in the child as in the adult. Physiologically, the child needs more calories and food than the adult to replace wear and tear; he loses more heat than the adult on account of the proportionately greater surface area of the skin. The digestive apparatus, circulatory, respiratory, and nervous systems and blood differ qualitatively, as well as quantitatively, in the infant and the adult; finally the chemical composition of the child's body is not the same as that of the adult. W. H. D.

TURNBULL, W. G.: HELIOTHERAPY IN THE TREATMENT OF TUBERCULOSIS. (Therapeutic Gazette, May 15, 1922, p. 310.)

Turnbull describes 2 years' special effort to use sunlight in the treatment of tuberculous patients at the Pennsylvania State Sanatorium at Cresson. In the children's department a special class was made of the sick children and those with surgical complications. They were placed on the lawn in charge of a nurse, and Rollier's principles were followed, the lower limbs being exposed for 15 minutes the first day, the time and area of exposure being increased each day. After exposure of the entire body was secured, an arbitrary maximum of 3 hours daily exposure was decided upon, divided into 2 exposures of 90 minutes each. The writer summarizes by saying that, inasmuch as sun exposure is necessary for the growth of plants and animals, it is a logical therapeutic agent in a disease characterized by low vitality. In pulmonary tuberculosis in children, graduated sun exposure appears to be free from danger, and to give excellent results. In the so-called "pretuberculous" cases, the results are better than those from any other form of treatment. W. H. D.

GIBSON, COLE B. AND CARROLL, WILLIAM E.: OBSERVATIONS ON THE DIAGNOSIS OF ACTIVE TUBERCULOSIS IN CHILDREN. (American Review of Tuberculosis, May, 1922, p. 213.)

The writers believe that the auto-urine test is of real prognostic and diagnostic importance in tuberculosis in children. It is of exceptional value in indicating, for treatment or observation, early or masked lesions. It assists materially in a children's sanatorium in standardizing, from the viewpoint of diagnosis, the types of cases to be treated; by its use pretuberculous and preventorium cases may be excluded from an institution devoted to the care of the actively diseased. The reaction was first described by Wildbolz, in 1919 (Correspondenz-Blatt fur Schweizer Aerzte, May 31, 1919, p. 793), and the procedure is as follows: Morning urine is evaporated to 1/10 of its volume, to concentrate the highly diluted antigens. This is done in vacuo, at a temperature never greater than 50° C., to prevent the destruction of these delicate bodies by heat. After filtration, a minute quantity is injected intradermally into the patient's own skin; at the same time a 1-1000 solution of tuberculin is injected intradermally, as well as a control fluid made from a urine of a non-tuberculous reactor. If there is an infiltration around the site of injection of the auto-urine to the extent of 3 to 5 mm, it is considered positive, and indicative of an antigen production as the result of an active tuberculous focus. W. H. D.

QUITTNER, SAMUEL S.: OBSERVATIONS ON ACUTE MASTOIDITIS. (Ohio State Medical Journal, June, 1922, p. 405.)

Prevention lies largely in the early opening of drums which are bulging, and in which the landmarks are lost, followed by rest in bed. Unless urgent symptoms arise, it is better to operate in the second, third or fourth week than earlier, partly because the condition may subside, and partly because it gives time for the formation of an inflammatory resistance wall. The x-ray, as an aid to diagnosis, is in itself of no value. The nature of the infection is of value in deciding when to operate; slight symptoms with a streptococcus hemolyticus infection may be of more significance than greater symptoms with a staphylococcus infection. Odor in acute ear discharge has no real significance; the leueocyte curve is of significance and following its indications is often a great help. W. H. D.

MORSE, JOHN LOVETT: LEUKEMIA AND SEVERE ANEMIA IN CHILDHOOD. (Boston Medical and Surgical Journal, May 18, 1922, p. 657.)

This study is based on 37 cases seen in 25 years and a summary shows the following findings: Myelogenous leukemia is a most unusual condition in childhood. Lymphatic leukemia is uncommon, but more frequent than the myelogenous type. More common than either is a very severe, and rapidly fatal, type of anemia in which there is a most profound depression of all the functions of the bone marrow. In certain cases there may be associated with it an increase in the productiveness of the lymphatic organ. The line between this condition and lymphatic leukemia is at times somewhat indistinct. It strongly resembles, if it is not identical with, the aplastic anemia of adults. Its relation to the purpuras can be determined only by a more careful study of modern methods. Its etiology is not clear, but analogy suggests that it may be the result of infection or intoxication. The ordinary type of pernicious anemia of adults is extremely rare in childhood. W. H. D.

ARCHIVES OF PEDIATRICS

SEPTEMBER, 1922

HAROLD RUCKMAN MIXSELL, A.B., M.D., Editor

COLLABORATORS:

Rowland G. Freeman, M.D...New York
W. P. Northrup, M.D........New York
Henry D. Chapin, M.D......New York
Francis Huber, M.D..........New York
Henry Koplik, M.D.........New York
Walter Lester Carr, M.D....New York
C. G. Kerley, M.D...........New York
L. E. La Fétra, M.D.........New York
Royal Storrs Haynes, M.D...New York
Herbert B. Wilcox, M.D.....New York
Charles Herrman, M.D......New York
Wm. Henry Donnelly, M.D...Brooklyn
Frank H. Richardson, M.D....Brooklyn
Edwin E. Graham, M.D.....Philadelphia
J. P. Crozer Griffith, M.D..Philadelphia
J. C. Gittings, M.D.........Philadelphia
A. Graeme Mitchell, M.D..Philadelphia
Charles A. Fife, M.D.......Philadelphia
H. C. Carpenter, M.D.......Philadelphia
I. A. Abt, M.D................Chicago
William P. Lucas, M.D...San Francisco
R. Langley Porter, M.D...San Francisco
E. C. Fleischner, M.D.....San Francisco
Oscar M. Schloss, M.D..........Boston
Maynard Ladd, M.D.............Boston
Charles Hunter Dunn, M.D.....Boston
Henry I. Bowditch, M.D.........Boston
Richard M. Smith, M.D.........Boston
L. R. De Buys, M.D.......New Orleans
Robert A. Strong, M.D.....New Orleans
John Foote, M.D............Washington
Joseph S. Wall, M.D.......Washington
B. K. Rachford, M.D.........Cincinnati
Henry J. Gerstenberger, M.D..Cleveland
Borden S. Veeder, M.D........St. Louis
Frederick W. Schlutz, M.D.Minneapolis
Julius P. Sedgwick, M.D...Minneapolis
William Weston, Jr., M.D..Columbia, S.C
A. D. Blackader, M.D.........Montreal
Edmund Cautley, M.D..........London
G. A. Sutherland, M.D........London
J. D. Rolleston, M.D...........London
J. W. Ballantyne, M.D.......Edinburgh
James Carmichael, M.D.......Edinburgh
G. A. Wright, M.D.........Manchester

PUBLISHED MONTHLY BY E. B. TREAT & CO., 45 EAST 17TH STREET, NEW YORK.

ORIGINAL COMMUNICATIONS

A CRITICAL STUDY OF TWO CASES OF RICKETS DEVELOPING IN BREAST FED INFANTS.*

(Analysis of Milk and Blood-serum.)

By Alan Brown, M.B.; A. M. Courtney, B.A.;
F. F. Tisdall, M.D., and I. F. MacLachlan, B.A.
Toronto

Instances of rickets with or without tetany are occasionally encountered in infants who have been fed exclusively at the breast. If the children have been living under hygienic conditions, it may be assumed that the rachitic condition is due to some abnormality in the mother's milk, either in respect to vitamine content or one or more of the salt constituents. Such irregularities are presumably traceable to a faulty diet of the mother.

---

*From the wards and Nutritional Research Laboratories of the Hospital for Sick Children and the Department of Pediatrics, University of Toronto.

It was thought worth while to verify these assumptions in the case of two children recently brought to the Hospital for Sick Children. The first was a child one year of age, still being breast fed. He was admitted on account of severe convulsions as a result of tetany.

CASE REPORT—BABY C.

John C., age 12 months, admitted March 17, 1922.

Complaint, spasm of hands and feet. Duration, 24 hours.

Feeding History. Baby had been nursed up until admission to hospital every 3 or 4 hours. No history of any intestinal upset. For past five months had occasionally been given a little bread. Had tended to constipation.

Present Illness. Twenty-four hours previous to admission, mother had noticed his hands going into spasms with fingers outstretched and thumbs adducted. Feet were stretched out and fixed.

Physical Examination. Weight 21 pounds, 14 ounces. Throat slightly red and congested. Liver at costal margin, spleen not palpable. Posterior fontanel closed; anterior fontanel 1 x 1 fingers. Some bossing and beading of ribs. No craniotabes. X-ray of long bones shows acute rickets. Chvostek's sign positive. Trousseau's sign positive.

Electrical Reactions. K.C.C., 1.5; K.O.C., —; A.C.C., 3.5; A.O.C., 1.2 (anodal irritability).

Blood. R.B.C., 4,300,000; W.B.C., 6,000; polymorphonuclears, 56 per cent.; hemoglobin, 85 per cent.

Tuberculin skin tests negative. Wassermann tests negative. Urine tests negative.

Progress of Case. Feeding given was: whole milk, 30 oz.; water, 10 oz.; cane sugar, 1 oz.; sig., 8 oz. q. 4. h. x 5.

On March 22nd, the child died following an acute respiratory infection.

The other child was six months old, also breast fed, brought to the hospital suffering from a subcutaneous abscess. He showed symptoms of severe rickets and secondary anemia.

CASE REPORT—BABY B.

John B., age 6 months, admitted June 8, 1922.

Complaints, swelling of left buttock. Duration, 2 weeks.

Feeding History. Nursed up to present time, but in addition to this recently received some whole cow's milk. Feeding at very irregular hours. Stools 2-3 a day, no vomiting, no history of any intestinal upsets.

Present Illness. Was admitted for incision and drainage of a large gluteal abscess (pneumococcus).

Physical Examination. Weight 13 pounds, 13 ounces. Mucous membranes pale. Slight craniotabes. Frontal bossing and beading of ribs. Slight sulcus present—epiphyseal enlargement. Anterior fontanel 2 x 3 fingers. Abscess over right gluteal region.

Blood. R.B.C., 3,680,000; W. B. C., 18,000; polymorphonuclears, 43 per cent.; hemoglobin, 33 per cent.

June 13, 1922. Blood serum Ca., 9.2 mg. Blood serum, P., 2.8.mg.

Urine negative.

X-ray of long bones gave positive evidence of rickets.

Progress of Case. June 8, 1922, feeding offered: whole milk, 15 oz.; water, 15 oz.; dextri-maltose, 1 oz.; sig., 6 oz. q.4.h. x 5 as a supplement to breast milk.

June 10, 1922, breast milk discontinued. Butter soup, 20 oz.; whole milk, 15 oz.; sig. 6 oz., q.4.h. x 5. Took this fairly well on this feeding until discharge.

Abscess was opened and drained on the day of admission. Child discharged to continue antirachitic treatment in out-patient clinic.

In each instance the children were at once given partial artificial feeding, and as large an amount as possible of the mother's milk was collected for analysis. A measured amount was taken and dried to constant weight on the water-bath, ground, and analyzed by standard methods for total salt content and distribution of the various salts. In the case of Baby C., enough milk was obtained to allow a fat determination as well. This was found to be high. In the other case, there was not milk available for analysis for fat, but the appearance of the dried sample indicated a high fat content.

The results of these analyses are given in Tables 1 and 2, together with corresponding average values for normal mature mother's milk obtained by Holt et al.[1]

TABLE 1.

Ash Constituents of Mother's Milk.
Grams per 100 c.c.

	Total Ash	CaO	MgO	P_2O_5	K_2O	Na_2O	Cl
Mother of Baby C...	0.2076	0.0367	0.0067	0.0569	0.0723	0.0161	0.0379
Mother of Baby B...	0.1813	0.0290	0.0074	0.0258	0.0618	0.0284	0.0475
Ave. Normal Milks....	0.206	0.047	0.008	0.034	0.057	0.014	0.035

TABLE 2.

Ash Constituents of Mother's Milk.
Per cent. of Total Ash.

	CaO	MgO	P_2O_5	K_2O	Na_2O	Cl
Mother of Baby C..........	17.7	3.2	27.4	34.8	7.8	18.3
Mother of Baby B..........	16.0	4.1	14.2	34.1	15.7	26.2
Ave. Normal Milks	23.3	3.7	16.6	28.3	7.2	16.5

Salt Content of the Mother's Milk. Both milks were found to be distinctly abnormal in respect to ash constituents. That taken by Baby C. showed a somewhat reduced calcium content and a greatly increased content of both potassium and phosphorus. In Baby B's milk both calcium and phosphorus were greatly reduced in amount while the quantity of sodium and chlorine was much greater than the normal average. Investigation into the diets of the mothers was made to see if the abnormality of the milk could thus be accounted for. The diets as reported for the periods during which the children were nursed follow.

Diet of Baby C.'s Mother. Diet of mother from March 18, 1921, to March, 1922 (period during which she was nursing baby).

Breakfast. Oatmeal or cornmeal porridge (moderate helping), with milk and sugar. Half slice of home-made bread with oleomargarine. Tea, 2-3 cupfuls (8 oz.), with moderate amount of sugar and milk. Bacon, one small piece once a week.

Dinner. A small helping (6-8 oz.) of vegetables; soup once a week. Moderate helping of potatoes. Stewed meat (meat boiled until it is "in ribbons"). Fat skimmed off stew. She does not like any fat—eats only the lean meat. Vegetables (turnips or carrots) a small helping probably once a week. Tea, 3-4 cupfuls, with milk and sugar. Rice pudding with milk and sugar about twice a week.

Supper. Bread and oleomargarine, 3 slices of home-made bread. Tea, 2 cupfuls with milk and sugar. Apple sauce or prunes about once a week. Slices of bread are large and thick —10″ x 6″ x ½″. Purity flour used. Uses margarine entirely in place of butter. Fond of sweet things and lean meat. Has a strong dislike for fat. City dairy milk used—mother never drinks milk.

Diet of Baby B.'s Mother. Diet of Mrs. B. during the six months that she was nursing the baby.

Breakfast. One or two fried eggs. Meat (beef usually), large helping. Bread, ½ slice, no butter. Water.

Dinner. Meat, fairly large helping. Potatoes, moderate helping. Sauerkraut, once a week. Occasionally ½ slice of bread, no butter.

Supper. Meat, moderate helping. (Pork chops once a week.) Potatoes, moderate helping. One slice of bread, no butter. (Says she often does not eat any supper.) She never eats butter but likes fat meat. She likes everything that is sour, but says she does not eat pickles, etc. Uses baker's bread. Never drinks tea, coffee or milk.

Baby C's mother's diet was without butter or eggs, and very low in milk and vegetables, carbohydrate food predominating. Thus it is seen that this diet must have been very low both in fat-soluble vitamine and in all mineral salts except potassium phosphate, of which a moderate quantity was provided in the cereal and bread forming so large a proportion of her diet. Baby B's mother's diet was entirely without milk and butter and very low in vegetables, meat and eggs predominating with only a moderate proportion of carbohydrate. Here again there is a great lack of fat-soluble vitamine and mineral salts. The quantity of sodium chloride was not reported in either case. Thus, in the case of Mrs. C., there seems to be a relation between the diet and the salts of the milk, the low calcium content and high potassium phosphate of the milk corresponding to a similar condition in the diet. With Mrs. B., since the food had little source of calcium except that of the eggs taken, it is not surprising to find so low a calcium content of the milk. Whether the unusual content of sodium chloride was a result of a large intake with the food is not clear.

Blood Analysis. Blood serum was obtained from each infant at the same time the milk was collected from the mother. The calcium and phosphorus content of the serum was then estimated, the calcium being determined by the method of Kramer and Tisdall[2] and the phosphorus by a method devised by one of us.[3] The results are seen in Table 3. In both infants the concentration of the calcium and inorganic phosphorus was distinctly abnormal. The serum phosphorus in active rickets, uncomplicated by tetany is always markedly reduced, while the calcium may be normal or only slightly diminished. These changes were found in the serum of Baby B, who had severe rickets without tetany. The phosphorus was reduced from the average normal of 5.4 mg. per 100 c.c. to 2.8 mg., while the calcium was only reduced from the average normal of 10.5 mg. Ca. per 100 c.c. to 9.2 mg. When rickets is complicated by tetany the figures are generally reversed, the phosphorus being normal or a little above normal and the calcium reduced. These changes are illustrated in the case of Baby C, whose serum calcium was reduced from the average normal of 10.5 mg. to 5.2 mg. The phosphorus was increased from the normal average of 5.4 mg. P per 100 c.c. to 6.8 mg.

TABLE 3.
Calcium and Inorganic Phosphorus Content of Blood Serum
Mgm. per 100 c.c.

	Ca	P
Baby C.	5.2	6.8
Baby B.	9.2	2.8
Normal Infants	10.5	5.4

Little is known of the factors which determine the concentration of the calcium and inorganic phosphorus in the blood serum. It is possible to increase the serum calcium and inorganic phosphorus in rachitic infants and cure the rickets, by giving either cod-liver oil (anti-rachitic vitamine) or exposing the infants to ultra-violet rays. The studies of McCollum and his co-workers have clearly demonstrated that for the experimental production of rickets in rats it is necessary to have a disturbance in the calcium-phosphorus ratio in the food combined with a lack of the anti-rachitic vitamine. Direct sunlight (ultra-violet rays) has apparently the same action as the anti-rachitic vitamine. The food of the two infants under discussion shows distinctly abnormal calcium-phosphorus ratios and also it is very probable that the anti-rachitic vitamine content was low.

The abnormal features of Baby C's blood, namely the low calcium and somewhat increased phosphorus content, is quite consistent with both the milk findings and the mother's diet. The low phosphorus in the serum of Baby B. is also in agreement with the milk composition. The nearly normal content of calcium in this case is not so consistent since the calcium content of Mrs. B's milk was even lower than that of Mrs. C.

There is little doubt that a disturbance in the inorganic phosphorus content of the serum has a definite effect on the concentration of the calcium and vice versa. Hastings and Murray[4] have shown that the reduction in the serum calcium in dogs, which follows parathyroidectomy, is accompanied by an increase in the phosphorus concentration. The condition of a patient would be very serious with the calcium greatly reduced in the presence of a low phosphorus value, and it would appear that the organism under such circumstances resists as far as possible any tendency towards a reduction in the calcium content of the serum. The almost normal calcium content in the serum of Baby B., apparently unwarranted by the calcium content of the milk, may thus be explained by the extremely low concentration of the serum phosphorus.

SUMMARY.

1. Two cases of rickets, one of these with tetany, developing on breast milk are reported.
2. A critical survey of the mother's diet during lactation revealed the lack of accessory food factors and certain inorganic constituents essential for the normal development of the child.
3. Analysis of the breast milks showed an abnormal ash content. In one (Baby C), there was a reduced calcium and increased potassium and phosphorus content, and in the other (Baby B), both calcium and phosphorus were reduced, the latter much below normal.
4. Blood serum analysis showed the concentration of the calcium and inorganic phosphorus to be distinctly abnormal. In Baby C. the calcium was much reduced, while in Baby B. the greatest reduction was in the phosphorus content.

CONCLUSION.

Serious consequences in the infant may result from neglect of the diets of nursing mothers. The presence of milk, eggs, fresh vegetables, cereals and butter is essential in order to avoid rickets and tetany in breast fed infants.

NOTE.—Since this article was presented for publication an article by L. von Meysenbug has appeared in the September number of the American Journal of Diseases of Children on the inorganic phosphate content of the milk of mothers and of the serum of rachitic and non-rachitic children. In this article the author quotes from Holt, Courtney and Fales the same value for total phosphorus content of normal woman's milk that is used as standard for comparison in the present paper. Through some error it is not stated correctly in von Meysenbug's article. The equivalent of 0.034 gm. P_2O_5 in terms of P is 14.8 mg. in 100 c.c. milk. In view of the disagreement between von Meysenbug's conclusion and ours, it should be borne in mind that the present paper deals with the total phosphorus content of the milk while von Meysenbug has reported the inorganic phosphate content.

REFERENCES

1. Holt, L. E., Courtney A. M. and Fales, H. L., Am. J. Dis. Chil., X, 229, 1915
2. Kramer, B. and Tisdall, F. F.: J. Biol. Chem., XLVII, 475, 1921.
3. Tisdall, F. F.: J. Biol. Chem., L, 329, 1922.
4. Hastings, A. B., and Murray, H. A.: J. Biol. Chem., XLVI, 233, 1921.

CARCINOID TUMOR OF MECKEL'S DIVERTICULUM (Lancet, London, July 8, 1922). Hicks and Kadinsky assert that no tumor of this nature has been recorded up to date as occurring in a Meckel's diverticulum. The patient was a boy, aged 12 years, who complained of sickness and abdominal pain. Seven weeks before admission he had had an attack of abdominal pain, vomiting and diarrhea, lasting twenty-four hours. The pain recurred about once a week for the next four weeks, and the attack lasted for an hour. After this attacks became more frequent and were accompanied by vomiting. A diagnosis of appendicitis was made, and the patient operated on the same day. At the operation the appendix, which was retrocecal, was found quite normal. A small amount of pus escaped in the region of the cecum, which was edematous and thickened, from the adherence to it of the distal end of an acutely inflamed Meckel's diverticulum. The diverticulum was 3 inches long, kinked and perforated; pus was present in the pelvis. The paracecal glands were enlarged. The diverticulum, appendix, and one gland were removed and the peritoneum drained. The patient made a good recovery.—*Journal A. M. A.*

HEART BLOCK IN INFANCY AND CHILDHOOD, WITH REPORT OF A CASE.*

By William Rosenson, M.D.
New York

Disturbances of rhythm and conduction have, until recent years, played but a small rôle in the cardiac diseases of childhood. The more general application of the electrocardiograph and the intensive study of special groups of young patients afflicted with cardiac disease are revealing an increasing number of such abnormal mechanisms.

Heart block is one of the rarer forms encountered in infancy and childhood. However, 36 cases have already been described in the literature.

Heart block may be defined as a disturbance of conduction due to an interruption in the passage of the impulse from the sino-auricular node through the auriculo-ventricular bundle and its branches to the ventricles. Brown[1] has described a case of sino-auricular block in a child of eleven years. The irregularity disappeared after the use of atropine. The first instance of this type of irregularity in childhood was reported by Joachim[2] in 1905. Recently, Sutherland[3] described several cases of sino-auricular block produced by the action of digitalis on the vagus. McCulloch[4] reported a case of diphtheria in a child of three years in which there developed a block in the right branch of the bundle of His.

The more common form of heart block is due to the failure of the auricular impulse to traverse the auriculo-ventricular bundle. The ventricle may respond only to every second or third contraction of the auricle producing a partial block (2:1 or 3:1) or it may beat independently of the upper chamber, a state of complete block.

Of the underlying causative factors, diphtheria has been the most common. It was present in sixteen of the 36 cases on record. In this group, the ages ranged from one to fourteen years. The onset of the heart block occurred as early as the fourth day of the disease in one case.[5] Usually it became evident from the sixth

---

*From the Children's Cardiac Clinic of Mt. Sinai Hospital, New York.
Case reported before the New York Academy of Medicine, Section on Pediatrics, January 8, 1920.

to the ninth day after the appearance of the diphtheritic membrane. Epileptiform convulsions and attacks of unconsciousness were present in two cases. The lowest ventricular rate recorded was five beats per minute. This case, reported by Heilhecker[5] was the only one of this series that recovered, the mortality being 93.7 per cent.

Recently, Smith[6] reported his observations on the heart in 242 cases of diphtheria. Heart block developed in about 4 per cent. of the cases. The number of children included in this group, however, was not given.

Post-mortem findings by various workers have thrown interesting light upon the cause of the block in cases of diphtheria. Magnus Alsleben[7] found widespread degeneration and diffuse cellular infiltration of the auriculo-ventricular bundle. Later, Cowan, Fleming and Kennedy[8], in the report of a case that succumbed on the tenth day, described an acute inflammatory process of the auriculo-ventricular node and upper part of the bundle with diffuse infiltration and separation of the muscle fibres. Hume and Clegg[9] found only engorgement of the vessels of the bundle. In the heart of another case[10], no changes were seen in the node or bundle.

In two cases block developed in hearts of patients with a definite history of rheumatism. Schuster[11] described a case in a girl of four years. In the course of an acute rheumatic attack with fever and swelling of the joints, a systolic murmur developed at the apex. Later, the ventricular rate dropped to 35 beats per minute and periods of extreme restlessness lasting one to three hours ensued. In the second case, noted by Naish and Kennedy[12], partial block developed in a case of rheumatic carditis and pericarditis.

D'Espine[13] described a case of complete block in a boy of 8½ years whose blood showed a positive Wassermann reaction. He attributes the condition to a myocarditis due to congenital syphilis.

An unusual case of cardiac tumor[14], a lymphangioendothelioma of the auriculo-ventricular node was found in a boy five years of age who presented a complete heart block and symptoms of Stokes-Adams disease. Death ensued after recurrent attacks during a period of 18 months.

Eyster and Middleton[15] described a case of partial auriculo-ventricular block which developed during the course of a nose and throat infection in a child of two years.

The following case has been observed at the Children's Cardiac Clinic at Mt. Sinai Hospital during the past three years and presents several unusual features.

REPORT OF CASE.

Bertha R., age 11 years, was referred to the clinic by the school physician on account of "heart trouble."

The mother had three miscarriages and three children died in infancy from acute infections. One sister had chronic heart disease. The child was born at full term, the labor was instrumental, long and tedious and the infant was blue for several hours after delivery.

In the past history, the patient had pneumonia at 6 months, diphtheria at one year, later measles and whooping-cough. There was no history of any rheumatic manifestations.

The present condition dates back to birth, when the mother was told the infant had "heart trouble." There were no symptoms until the age of seven, except frequent colds with cough. Since then the only complaint has been moderate pain over the precordium on considerable exertion, such as running, jumping and rushing upstairs. The child has attended school regularly. There have been no attacks of heart failure.

On physical examination the child appears mentally alert but distinctly stunted in growth. She is 20 pounds underweight and four inches below the normal height. The heart is definitely enlarged to the left, the apex impulse being felt 10 cms. to the left of the midsternal line in the 5th interspace. The right border is at the right sternal margin. A distinct systolic-diastolic thrill may be felt over the precordium. On auscultation, a long rough sawing murmur systolic and diastolic in time is best heard in the 3rd left interspace and transmitted in all directions over the precordial area. The pulse rate varies between 44-60. The rest of the physical examination is negative.

The electrocardiogram shows a complete auriculo-ventricular heart block (Figure 1). Auricular rate 100. Ventricular rate 48. There is a slight notching of the Q R S complex in Lead 1. The main wave of the Q R S complex in Lead 3 is inverted and this is considered by most authors as evidence of left ventricular preponderance.

The Wassermann reaction is negative, urine examination and blood count are normal. Von Pirquet test is negative.

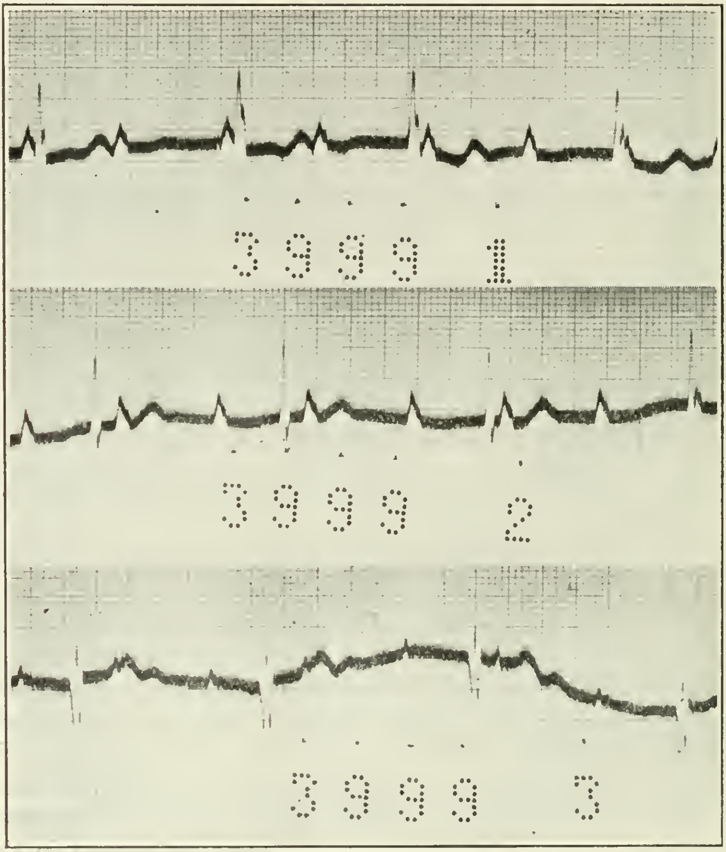


Fig. 1. Ordinates: 1 division = 10^4 volts; abscissas: 1 division = 0.04 second. Complete heart block.

Fluoroscopic examination shows a synchronous contraction of the left and right side of the heart.

Teleroentgenogram reveals enlargement chiefly to the left.

The results of the functional tests were as follows: after hopping 100 times there was no cyanosis and the blood pressure dropped to the normal within two minutes. The patient was able to do 1,200 foot pounds of work in two minutes without showing a delayed rise in blood pressure.

From the history, course and character of the murmur, we may conclude this patient has a congenital cardiac lesion. It is difficult to localize the defect. Fluoroscopic examination revealing a strong synchronous contraction of both sides of the heart indicating a dilatation of the right ventricle, suggests an open interventricular septum. But the character of the murmur, the cardiac enlargement and the presence at times of precordial pain reminds one of a group of cases collected by Hektoen[16] in which there was a partial defect of the aortic septum. It consists of an opening in the anterior wall of the aorta a short distance above the semilunar cusps which communicates with the pulmonary artery just above its origin.

This case presents, then, an unusual congenital cardiac defect with complete auriculo-ventricular block in a physically underdeveloped child whose only complaint is occasional pain in the precordium.

Up to the present time 9 cases of congenital heart disease showing evidence of auriculo-ventricular heart block have been described. Marquio[17], in 1901, was the first to record this condition. It was present in two brothers, five and eight years old, both of whom suffered from attacks of syncope preceded by vertigo. Their pulses ranged between 50 and 70. V. Stark[18], in 1903, described a fatal case in a boy of five years, pulse rate varying between 28-44. V. D. Heuvel[19] noted a case of open interventricular septum with recurrences of complete heart block in a girl of 13 years. The rate was 34.

Fulton, Judson and Norris[20] recorded the occurrence of congenital heart block in a father and two children, one an infant. The interpretation of the tracings of the father and elder child, however, have been proved to be incorrect[21]. The younger child, 22 months, showed congenital heart block with open interventricular septum.

In 1915, Zahorsky[22] describes one, and Whipham[23] two cases of congenital heart disease with heart block. In 1918, Bass[24] published a study of the condition with a report of a case in a boy of 15 years under observation at the Mt. Sinai Hospital dispensary.

A loud murmur was present over the pulmonic area. The ventricular rate was 37.

Gortor[25] reported a case of congenital heart block in an infant of six months. The slow pulse was first noted at the age of six hours.

In 1920, Carter and Howland[26] described a case of congenital heart block in a girl of five years. At the age of four years there was a slight syncopal attack. There was no cyanosis or dyspnea. A harsh systolic murmur was present at the apex. The rate was 46.

Recently, White, Eustis and Kerr[27] have described the youngest case on record. Eight hours before birth an irregular fetal heart rate was noted. At the age of four days the electrocardiogram showed a partial heart block. The infant was a Mongolian idiot. The cardiac murmurs were those of a patent ductus arteriosis and a septal defect. The same authors described a case of complete heart block in a boy of six years which they believed was probably congenital. A loud systolic murmur was present over the pulmonic area.

Not all of the earlier reports contain electrocardiographic evidence. In the recent records, however, such evidence has been presented.

The explanation of the occurrence of heart block in the congenital cases has not been definitely determined. One might conclude that septal defects would frequently involve the conduction fibers. But the work of Keith, Monckeberg and Morrison[28] and later of Flack and Mall[29] does not confirm this view. They found little change in the course and arrangement of the bundle in cases of septal defects. Thalhimer[30] has suggested the possibility of inflammatory changes in the valves due to the mechanical injury of abnormal blood currents, and it is perfectly possible that there may be inflammatory changes in the auriculo-ventricular bundle in hearts with congenital anomalies. Thus far, however, there has been insufficient evidence to warrant any definite conclusions with regard to the etiology of heart block in cases of congenital cardiac defects.

I wish to express my indebtedness to Dr. B. S. Oppenheimer for the helpful suggestions he has given me in the preparation of this paper.

BIBLIOGRAPHY

1. Brown: Arch. Int. Med., 24:458, 1919.
2. Joachim: Deutsch. Arch. f. klin. Med., 1905.
3. Sutherland: ARCH. PED., 38:188, 1921.
4. McCulloch: Am. J. Dis. Child., 20:94, 1920.
5. Heilhecker: Ztschr. f. Path., 8:319, 1911.
6. Smith: J. A. M. A., 77:765, 1921.
7. Magnus Alsleben: Ztschr. f. klin. Med. 70:821, 1910.
8. Cowan, Fleming and Kennedy: Lancet, Feb. 3, 1912.
9. Hume and Clegg: Quart. J. Med., 8:1:1914.
10. Price and McKenzie: Heart, 3:233, 1911-1912.
11. Schuster: Deutsch. med. Wchnschr., 22:484, 1896.
12. Naish and Kennedy: Lancet, 2:12:42, 1914.
13. d'Espine: Bull. de l'Acad. de med., 74:372, 1915.
14. Armstrong and Mönckeberg: Deutsch Arch. f. klin. Med., 102:143, 1911.
15. Eyster and Middleton: Am. J. Dis. Child., 19:130, 1920.
16. Hektoen: Trans. Chicago Path. Soc., 1905.
17. Marquio: Arch. de med. d'enf., 4:467, 1901.
18. Stark: Monatschr. f. kinderh, 2:11, 1903.
19. V. d. Heuvel: Profsch. B. V. Groeninger, 1908.
20. Fulton, Judson and Norris: Am. J. M. Sc., 140:339, 1910.
21. White, Eustis and Kerr: Am. J. Dis. Child., 22:299, 1921.
22. Zahorsky: Interstate M. J., 22:57, 1915.
23. Whipham: Brit. J. Child Dis., 12:321, 1915.
24. Bass: J. A. M. A., 70:287, 1918.
25. Quoted by White, Eustis and Kerr: Am. J. Dis. Child., 22:299, 1921.
26. Carter and Howland: Bull. Johns Hopkins Hosp., 31:351, 1920.
27. White Eustis and Kerr: Am. J. Dis. Child., 22:299, 1921.
28. Keith, Mönckeberg and Morrison: Journ. Anat. and Physiol., 47:459, 1916.
29. Flack and Mall, quoted by Abbott: Osler's System, 4:367.
30. Thalhimer, quoted by Abbott: Osler's System, 4:366.

BACILLUS COLI INFECTION OF URINE (Lancet, London, June 24, 1922). Hale-White states that sufferers from this condition must stay in bed; plenty of bland drink, such as barley water, should be given to wash out the bacilli; food should be light and suitable to the degree of the rise of temperature. In young children it is particularly important by every possible means to get them to take and absorb nourishment, for they waste rapidly in many instances. If pain or frequency of micturition lead to bad nights, hyoscyamus, and, if necessary, sleeping draughts, or even morphin, should be given. The patients so rarely die, and the disease is so frequently overlooked, that we must conclude that the natural tendency is for these patients to get well. Therefore, it is difficult to be sure whether any particular treatment is beneficial, but it seems reasonable to try to disinfect the urine. But if the disease is primarily a blood infection and the bacilli are excreted by the urine and then set up the urinary symptoms, this treatment will not affect such of the symptoms as are due to the blood infection. Usually an autogenous colon vaccine is used; it is difficult to prove that it does good, but to give it is reasonable. Those who have suffered from the disease once are especially liable to do so again; such either have a low resistance to the bacilli or in them they are especially virulent.—*Journal A. M. A.*

CHOLECYSTITIS AND CHOLELITHIASIS IN CHILDREN.*

By Charles E. Farr, M.D.

New York.

Cholecystitis and cholelithiasis in children are shown casually in the medical literature and sporadic cases are described. One series of cases in children as such has come to light.

The following cases have come under my care in the past two years at the New York Hospital in the Cornell, or First Surgical, Division in the service of Dr. Charles L. Gibson and in my service at St. Mary's Free Hospital for Children.

Case I. J. F., 13 years of age, a schoolboy, entered the New York Hospital, April 11, 1920; was discharged April 25, 1920. Complaint was severe colicky pain in the right upper quadrant, with vomiting.

First attack was at the age of nine with jaundice and severe vomiting and pain, similar to the present attack. There have been irregular attacks since, every two or three months, and of late, every week or two. The last attack was one week previous to admission with violent pain and no relief by medical means. He has been yellow in some of these attacks. There has been persistent dyspepsia and gastric pain on eating, since the first attack. The present attack began with sudden onset of severe pain in the right upper quadrant, early on the day of admission, with nausea. The stools were normal. There were slight chills, no jaundice. On admission, the temperature was 101°, pulse 80, respirations 20. The leukocytes were 35,000; the polymorphonuclears 95 per cent. Physical examination showed an acutely ill child, with moderate rigidity of the upper right rectus and marked tenderness. No definite mass was felt. There was slight tenderness over McBurney's point. The diagnosis of cholecystitis was entertained, with the possibility of a high lying appendix in view. Under the anesthetic the distended gall bladder could be distinctly felt. Operation at once; high right rectus incision, gall bladder enormously enlarged and embedded firmly in the liver, projecting 2 inches below the liver surface. There was considerable edema of the liver about the gall bladder. The entire pancreas was thickened. No calculi were felt. Examination of the rest of abdomen showed nothing abnormal, except an enlarged and congested and slightly edematous appendix. The gall bladder was dissected from its bed in the liver and removed from above downwards. A cigarette drain was placed at the stump of the cystic duct. The appendix was also removed. There were enlarged nodes in the region of the ileocecal valve and about the pancreas. The operative recovery was uneventful.

---

*Read before the Surgical Section, New York Academy of Medicine, March 3, 1922.

The pathological report of the appendix was a distended lumen with flattened epithelium. There was no evidence of inflammation. The gall bladder was 10 x 3 centimeters. Wall slightly and uniformly thickened, filled with clear mucinous material in which are many small white calculi. There is a septum incompletely separating off a portion of the tip of the fundus from the rest of the cavity. The inner surface is smooth.

Microscopical examination: The wall shows no new growth of inflammatory, connective tissue. The mucosa also is unchanged. Areolar tissue around the gall bladder, as well as the muscle coats, shows infiltration of plasma cells and polymorphonuclears.

The urine reports showed bile present up until the fifth day. The temperature never rose above 101°, dropped to normal on the eighth day and remained so. The drain was removed on the seventh day. The wound healed by first intention except at the drainage site. He was home on the 14th post-operative day, and was examined on October 16th, 6 months after the operation, and was in excellent general health, without symptoms. Unfortunately no culture was made of the contents of the gall bladder nor of the wall.

CASE II. S. D., 12 years of age, schoolboy, born in the United States, entered the New York Hospital, January 19, 1922, and was discharged February 7, 1922, cured. The complaint on entering was pain in the right upper abdomen.

History. Four days ago, while in school, he was taken violently ill with pain in the epigastrium. He vomited and has vomited daily since. He could not eat. The bowels were constipated but were moved by castor oil. The pain became worse and settled definitely in the right upper quadrant where it is at present. There were no urinary nor cardiorespiratory symptoms. There was one attack of pain in the stomach two months before this attack. It lasted one night. The pain was extremely severe, was in the right upper quadrant and did not radiate. The pain is not the same as the present pain.

Past History. The patient was run over by a truck several years ago and was in hospital. There was no history of jaundice at any time.

Examination. The boy appeared acutely ill with coated tongue, bleeding crusts in the nose, marked tenderness in his right lower abdomen, rigidity of the rectus and a distinct mass in the right upper quadrant. His leukocytes were 15,600; polymorphonuclears 88 per cent. The temperature was 100°, pulse 100, respirations 24. Operation was performed at once. High right rectus incision. Gall bladder found large, thick and tense, covered with omentum, with a little fibrin about. The peritoneum over the gall bladder was split and the organ was removed extraperitoneally, down to the cystic duct which was ligated. There was a profuse gush of greenish bile. No calculi were seen. The appendix was very large, red, edematous, and was removed. Post-operative recovery was uncomplicated. The highest temperature was 103°, pulse 140. This immediately dropped to below 100 and remained so throughout. He vomited once after the operation. Stools were normal. There was considerable discharge of bile for about 15 days. The leukocytes were normal the fifth day after operation. Culture from the peritoneal fluid was sterile 9 days. No culture was made from the gall bladder. The urine showed a faint trace of albumen on one occasion only, post-operative, and twice there were traces of acetone. It was negative for bile.

The pathologist's report was acute cholecystitis. The gall bladder was normal in size, with a thickened fibrosed wall, 2 to 3 millimeters thick. This was without peritoneum in addition.

The microscopical examination showed acute purulent inflammation. The appendix 6½ centimeters by 8 millimeters, showed marked congestion but microscopically only an involvement of the outer coats.

Case III. J. R., 8 years of age, schoolboy, entered the New York Hospital, January 17, 1921, complaining of pain in the abdomen and fever, and left February 1, 1921.

His history was that he had been ill for 2 days, with pains all over the body, and fever which had reached 102°. His appetite was lost, bowels constipated. He vomited medicine twice. There was no cough. After the first day the pain seemed more severe in the right abdomen but was not increased by respiration. There was a grunt with respiration but no dyspnea.

Past History. Boy has not been very rugged. Had scarlet fever and chicken pox at two years of age. Rheumatism and kidney trouble, with heart trouble, at 4 years of age. Tonsillectomy performed at 6 years of age.

Examination. There was slight impairment of resonance with slight diminution of breath sounds at the right base. Expansion was slightly limited, but there were no râles. There was tenderness on deep palpation in the abdomen throughout, not well localized. The spleen and liver were not felt. There was a slight increase in the rigidity of the right rectus. Rectal examination seemed to show slight tenderness in the right side.

Operation performed at once as an exploration, probably for appendicitis; right rectus incision. Large bowel found moderately dilated and congested. This was true also of the appendix which seemed slightly edematous but very doubtfully so. It was long, subcecal, lying over the pelvic brim; removed. Exploration showed a gall bladder which was quite enlarged and extremely tense. It felt a little stiff and its contents could not be emptied until great pressure was exerted. After the bile was expressed, the gall bladder did not feel particularly diseased, and it was not deemed wise to remove it nor to drain it. The abdomen was closed without drainage. The leukocytes were 28,000 and polymorphonuclears 83 per cent., and shortly afterward were 43,000 and 88 per cent., both on the day of admission. They declined on the following day to 19,000 and 80 per cent. The Widal was negative.

The pathologist's report was that the wall of the appendix showed a very slight polynuclear infiltration. The mucosa was negative and the glands atrophic. The diagnosis, acute appendicitis. The blood culture was negative on the day following the operation. The urine was negative. The temperature on admission was 103.4° ; pulse 108-120. The temperature came to normal on the sixth day, post-operative. Fluoroscopic examination of the chest showed no thoracic involvement nor density. He was discharged cured and has remained well since.

Case IV. A. P., 8 years of age, schoolboy, born in the United

States, entered St. Mary's Hospital, July, 1921, complaining of fever and general malaise of six days' duration.

Past History was negative, except that three years ago he was sick for a week with vomiting and pain in his stomach. His physician said that he was poisoned and washed his stomach out. The present illness began with a sore throat and vomiting on medication. There had been a prodrome of one week of general malaise but no other symptoms. There was no bleeding from the nose, no diarrhea, nor constipation. There was no complaint of pain nor headache. There was no known typhoid in the family.

On admission the temperature was 103°, pulse 128, respirations 36. Leukocytes 36,000; polymorphonuclears 87 per cent. There was tenderness in the right hypochondrium and right lower quadrant and an apparent mass in the region of the liver. The right lumbar region was tender. There was a friction rub at the right base. Urinalysis showed a cloud of albumen, very few casts and no leukocytes. The von Pirquet was negative; the Schick test, positive. The boy was apathetic, sallow, evidently seriously ill, not stuporous nor excited. There was no eruption. The tongue showed a heavy coat. The breath was foul, pharynx congested, no enlarged nodes. The heart and lungs were negative. The abdomen showed some general distention and rigidity. The spleen was not felt.

Operation was performed July 29, a right upper rectus incision with the diagnosis of probable abscess of the liver or cholecystitis. The peritoneum and abdominal wall were markedly edematous. There was no free fluid. The liver in the neighborhood of the gall bladder was much enlarged and studded with large and small abscesses. The gall bladder was thick walled, enormously distended, contained clear mucoid material. A small section of liver was excised and cultured. The gall bladder was partially removed and drained. The boy died August 17, after developing many abscesses throughout the body.

Cultures from all the abscesses and from the liver abscess showed staphylococcus aureus. A number of transfusions were performed with only temporary benefit. Blood culture showed a pure staphylococcus aureus septicemia. The culture from the contents of the gall bladder was sterile. The Widal was negative. The urine showed no bile until the 10th day when there was a trace. The urine culture was also positive for staphylococcus aureus.

1. The pathologist's report showed in the liver tissue dilatation of the capillaries and cloudy swelling of the liver cells. There was a number of focal abscesses composed of dense circumscribed sections of leukocytes, sometimes associated with necrosis of the liver cells and, in the center, with a solid plug of cocci. These lesions seemed to be centered on the portal canals.

2. The mucosa of the gall bladder is swollen and edematous but the epithelium seems intact. The muscularis and subserous tissue is enormously swollen and infiltrated with leukocytes and fibrin. In the subserosa there is much necrosis of tissue and many veins appear thrombosed and filled with leukocytes.

Diagnosis. Acute cholecystitis; multiple abscesses of the liver.

A complete autopsy was performed, showing multiple abscesses everywhere. Date of autopsy, August 17, 1921, by Dr. Jas. W. Howard, House Surgeon. Showed a mild icterus, numerous furuncles. The heart showed two small hemorrhagic areas. Two small abscesses were present in the wall of the posterior coronary artery. Numerous small fresh vegetations on the mitral valve. Left pleural cavity contained small amount of bloody fluid. Right superior and middle lobes showed bronchial pneumonia in a state of consolidation. Both lower lobes firmly adherent to the diaphragm by fresh fibrin. Abdomen contained no free fluid. Liver bound firmly to the diaphragm and stomach by fresh fibrin and to the anterior abdominal wall. Many miliary abscesses are present in the liver, containing yellow pus. Gall bladder covered with thick layer of fibrin and firmly adherent to liver. Pus escaped from around it. On section of the liver, little normal tissue is left. Pus exudes from central veins. The common duct was patent and pus was found in its lower third. The wall was not thickened. A rather large abscess was found in the upper and lower poles of the right kidney, not extending to the pelvis. Left kidney contained one small abscess on the surface. Pelves, normal. Spleen, enlarged, cut surface dark, friable. Malpighian bodies not seen. No abscesses. Pancreas normal. Stomach mucosa much congested. At the pre-pyloric region is an area of elevated mucosa, one centimeter in diameter. Intestines slightly injected. Mesenteric nodes enlarged. Those about the pylorus suppurating. Mediastinal nodes enlarged, not suppurating. Bladder normal. Head not opened.

Case V. H.S., schoolboy, 7 years of age, born in the United

States, entered New York Hospital, September 28, 1921, for removal of tonsils and adenoids; discharged October 1, 1921.

He had had an obscure illness during the summer and ran a little temperature. There were no positive findings. Operative recovery normal. He remained well for about 4 weeks and then developed fever and malaise without definite symptoms. He reentered the hospital November 4, 1921, and was discharged February 7. During this time he ran a temperature from 104° to 106°, breaking to about 100° after November 22, but relapsing many times and finally breaking December 30, running after that to about 100°.

Physical Examination was negative except a few râles in the lower lobes, enlargement of the liver and possibly spleen. He developed jaundice and a positive blood culture for staphylococcus aureus. The Widal was positive, 1 to 40 and 1 to 80 on admission. The hemoglobin was 70 per cent.; the leukocytes 7,000; the polymorphonuclears 56 per cent. On December 12, the leukocytes rose to 17,000 and 92 per cent., with 2,390,000 red cells. The leukocytes gradually diminished and on December 23 were 8,000 and 73 per cent. The Schick test was positive. Cultures from the nose and throat negative for diphtheria. Stools negative for parasites and ova. The von Pirquet skin test was negative. Widal test, later in the disease, became negative. There was no blood at any time in the stools. His jaundice lasted several weeks, the stools being clay colored but gradually clearing up. The urine showed a marked trace of albumen at times and some hyaline and granular casts. Bile appeared in the urine November 24 and persisted for about a month. He vomited repeatedly, had several chills and developed edema of the abdominal wall, ascites, and a slight effusion of fluid into the right pleural cavity. This was sterile and showed no tubercle bacilli on injection into guinea pig. In the latter part of December, his condition began to improve. The stools became colored with bile. The edema went down and the liver could be distinctly felt as much enlarged and hard. X-rays showed no pneumonia but showed the liver pressed firmly up against the diaphragm by an excess of abdominal fluid. At no time could the gall bladder be distinctly felt nor was there special tenderness. He left the hospital in fairly good condition, still running a subfebrile temperature, with the icterus nearly gone and the abdomen approaching normal. No operation was done.

Summary. Five cases of cholecystitis are presented. All were in male children, with ages varying from 13 years to 7 years. One was simple, acute cholecystitis; one probably simple acute. One had calculi. One was acute suppurative; one acute suppurative with general sepsis; one probably acute suppurative with general sepsis. There was one death. All presented the usual symptoms of pain, tenderness, rigidity, vomiting, fever, leucocytosis. One had severe jaundice, two were mildly icteric. One gave a history of preceding attack with jaundice. Enteric fever may possibly have been an etiological factor in one. Staphylococcus aureus was found in the blood of two cases. Acute appendicitis was present, in mild degree, in three of the cases.

CONCLUSIONS.

1. Cholecystitis in children is probably not very rare but is usually unrecognized.
2. So far as this small series goes male children are more often attacked than females, the reverse of adult conditions.
3. The clinical picture of cholecystitis in children closely resembles that in adults and the pathological findings are similar.
4. The preceding etiological factor, in some cases at least, is a bacteriemia.
5. Acute appendicitis is a frequent concomitant, if not an etiological factor.

BIBLIOGRAPHY

A. J. Hall: Lancet, Vol. CXCIX, 1920. (Reports 30 cases in all. Onset of symptoms before age of 20 in four.)
Edgar R. M. Guise: Surg., Gyn. and Obst., Dec., 1920. (252 cases, less than 10 per cent. under 30.)
Reed and Montgomery: Bull. Johns Hopkins Hosp., Vol. XXXI, 7 (1920). (Collected 28 cases of typhoid in children under age of 15 years. Either died from, or were operated upon for, gall bladder complication; added 6 cases of their own.)

LEAD POISONING IN CHILDREN (Medical Journal of Australia, July 15, 1922). The three cases cited by Littlejohn are examples of lead intoxication being caused by the repeated ingestion of small quantities of lead paint over a prolonged period. One little girl, aged 3 years, spent considerable time each day standing on a chair looking out of a window and had sucked and bitten most of the paint off the lower part of the window sash and frame. Another patient, a boy, aged 9, had been in the habit of playing with some pots of paint his father had in a shed, painting everything about and getting the paint all over his hands; also he was in the habit of biting his nails.—*Journal A. M. A.*

CONGENITAL HYPERPLASTIC PYLORIC STENOSIS

By Dudley W. Palmer, M.D., F.A.C.S.

Cincinnati

Pyloric stenosis of infancy or hyperplastic pyloric stenosis is a well established entity whose symptomatology is the trilogy of explosive vomiting, iso-peristaltic gastric waves, and a pyloric tumor. All other symptoms are negative ones or dependent upon the cause of the obstruction at the pylorus. The third is the least important in the making of a diagnosis. These three symptoms have associated with them in variable degree, starvation, dehydration, and acidosis.

In other papers, [1], [2], [3] I have gone at length into the symptomatology and diagnosis. You have frequently heard a medical view-point. I wish to offer a somewhat different premise, attempting to explain my stand that pylorospasm and hyperplastic pyloric stenosis may be one and the same condition. I do not see the object of dividing the cases with a given symptom-complex into two parts, making two separate entities merely because some cases of that symptom-complex get well, without operation or residual symptoms, and others require an operation or have sequelae.

During the active stage of a socalled case of pylorospasm of infancy the medical attendant will be uncertain as to whether or not the case is one of spasm or so-called true stenosis. He may call his temporary diagnosis an "impression." Some one has called the making of "impressions" the greatest indoor sport of the modern hospital. After days or weeks of worry and many ups and downs, if the case recovers, he is convinced that his "impression" of a spasm was always his positive diagnosis.

On the other hand, if the spasm "impression" lures him on for weeks, until the malnourished child is forced into operation and urgent surgery, or even emergency surgery, then the spasm concept has been a delusive snare, a false hope, and one of those quickly formed opinions we are all loth to change. The inertia inherent to change of opinion may permit a weak six or eight weeks old baby to slip down past its ability to stage a come-back.

To my own satisfaction, I am convinced that it is possible to place these "two entities," one of which is surgical, one medical, these "two entities" over which their adherents will argue for hours, into one class and readily explain all the phenomena.

The lumen of the pylorus of a new-born infant is about the size of a lead pencil. The possibilities as to the amount of muscle hyperplasia in any given pyloric sphincter are infinite as there may be any grade of hyperplasia from the normal sphincter to one so thick as to cause complete obliteration of the canal. The pyloric aperture grows in diameter the same as does the lumen of the stomach because of normal growth and because of use. Use increases the size of any cavity, as for example, the urinary bladder, which, when not used, soon contracts until it has a capacity of but a few ounces.

The genitourinary surgeon does not call the acute swelling that occasionally occurs in the course of a chronic prostate hypertrophy a spasm even though this swelling does produce a temporary retention of urine. The periurethral prostatic hypertrophy is analogous to the peripyloric hyperplasia of congenital pyloric stenosis. In the later advanced cases, the dilated stomach may be compared to the heart with broken compensation.

Accepting the above statements, one can readily understand how, in the case in which the pyloric sphincter shows only a little hyperplasia, the natural growth of the opening in a few weeks or months carries it past the point at which this slight encroachment of the muscle wall on the normally small lumen can cause obstructive symptoms. Here the child actually outgrows the mechanical condition causing the symptoms, and the believer in "spasm" says the "spasm" condition has been cured. Can some one tell why an infant, and only a few infants, and these usually well developed, healthy infants, should be given to "spasm" of only the involuntary muscle of the pylorus for the first few weeks of life? Were there two entities with similar symptoms, one would expect that surgeons and medical men would have, not infrequently, reported operations on babies under the mistaken diagnosis of pyloric hyperplasia, only to find a spasm. The literature is strikingly free of such references.

In every case I have operated upon I have noticed a more or less marked edema of the pylorus. It is largely this edema that gives the tumor the "cartilage feel" and makes it more pale in color than the adjacent stomach or duodenum. It is so edematous that I have given up any attempt to place a cat-gut ligature in the tissue to control a small bleeding point, for it will cut out as in hard butter.

To this edema, noticed by all who have operated on such cases, we can attribute the variation in the severity of the symptoms, or the medical and clinical evidence of the socalled "spasm." All medical treatment, such as paste feeding, belladona derivatives and the alkalies, is such as to lessen this edema. Why call the improvement that may result a therapeutic proof that the cause of the symptom was "spasm"? I offer the explanation, therefore, that practically all cases with the symptom-complex of explosive vomiting and iso-peristaltic gastric waves are cases of pyloric sphincter hyperplasia of more or less degree, on top of which is engrafted a variable edema. This makes of these cases one entity instead of two, and I believe leaves in the physician's mind a better foundation on which to work and watchfully await improvement should it come. If it does not come, he will more readily appreciate the surgical aspect of the case and act at a time when the surgical prognosis is yet excellent.

The use of the duodenal tube as a method for estimating the degree of patency of the pylorus is most excellent and in my opinion may indicate the degree of obstruction due to hyperplasia and edema and not the presence or absence of "spasm" in contradistinction to hyperplasia, or both combined as has been stated.

The next point I desire to stress is that the evaluation of the child's condition and need for operation consists of a careful estimate of the relation of the present age and present weight to the birth weight. A child three weeks old, at, or even a pound or two, below birth weight, is in far better condition than the child of two or three months weighing a couple of pounds over birth weight. The evidence of dehydration or starvation as noted in the feel or appearance of the skin, the sunken fontanels, the concentrated urine or the almost meconium-like stools, are the signs for urgent surgery, and signs which should not be waited for. Such signs creep up far more stealthily and rapidly in the hot summer months than in the winter. If watchful waiting is deemed advisable, it should be associated with careful and daily weighing, bearing in mind that the weight remaining at a standstill actually means a loss in weight.

No infant, I believe, is in such bad condition but that a day spent in getting fluids, alkalies, and glucose into its body will not improve its condition and lessen the surgical risk. The only post-operative death I have had was in a shriveled, shrunken· starved and dehydrated baby I made an "emergency" case of and operated on an hour or so after first seeing it.

My success with those cases has been very pleasing but easily no more than any trained surgeon might have. The operation is so simple that it almost belongs to the class of "grand-stand stunts," and yet if certain points are not carefully watched absolute failure will result.

In one of my earlier papers the observation was made that thymus enlargement seemed to be frequently associated with pyloric stenosis of infancy and a possible inter-relationship was suggested. Since then, extensive observations by Benjamin,[4] and Blackfan and Little[5] have shown that thymus enlargement occurs in so large a percentage of normal infants that we are not justified in placing any weight on the relationship between thymus enlargement and pyloric stenosis other than the desirability of knowing the condition of the thymus before instituting any surgical procedure or giving an anesthetic. Whenever thymus enlargement is found, it is best to give one treatment before operation, as such treatment will not interfere with the preparation that is desirable. I usually have the radiographer take a picture of the child so as to show a broadening of the thymus shadow if it exists, this picture to be taken on a plate large enough to include the abdomen. Thus we get an idea as to the size of the stomach, the "gas bubble" outlining the stomach sufficiently well without the use of an opaque meal. A large dilated stomach that does not show the notch of a peristaltic wave is of prognostic value, indicating an atonic condition of the stomach musculature with a relatively poor prognosis.

The preparation before operation, in addition to that above, largely consists in the introduction of a considerable amount of fluid into the body tissues. The clinical judgment of the surgeon indicates the quantity of fluid to be introduced, but it is usually well to have a hypodermoclysis of from 30 to 100 c. c. of normal salt solution given subcutaneously every four hours for about five doses. Several soda enemas, both for the purposes of retention and cleansing the lower bowel, are advisable, as practically all these children have a tendency to some acidosis and alkalization is of value. One must be on guard not to produce a condition of over alkalization. About one-half of the babies in poor condition will be running a rather high temperature that cannot be accounted for on any other basis than that of starvation and dehydration. The effect a few subcutaneous salt solution injections have on these high temperatures is remarkable. A five per cent. glucose solution, per rectum, is also of great value· both pre-operative and post-operative, wherever starvation is a prominent feature.

At least one gastric lavage with soda solution is necessary. If there is a large amount of mucus being vomited, two may be desirable; the first one, given early in the first 24 hours of preparation and the second one, given just before the patient is taken to the operating room. The feedings are continued regularly up to the time of operation in the hope that some of the food may be forced through the pylorus, and any residue in the stomach before operation is taken care of by the gastric lavage immediately before operation. This gastric lavage deflates a stomach which is very apt to be distended with gas. These measures cover practically all the necessary pre-operative preparation.

The operating room must be very warm, and it is desirable to have warm blankets or pads for the child to lie upon. The giving of the anesthetic to these babies is almost as serious a procedure as the operation, for the anesthetizing of a baby weighing several pounds less than birth weight requires a very great deal of skill and experience. A drop or two more or less of anesthetic may produce either too deep an anesthesia or struggling. Towels are pinned to the pad beneath the child and over the thighs and arms in such a way as to control any squirming.

The skin of the abdomen and lower chest is sterilized with either pure alcohol alone or a weak (two to three per cent.) solution of iodine in alcohol. I know of infants whose skins have been badly blistered by using too strong an iodine solution. It is very desirable to use a small and high right rectus incision, as one can better control any tendency to evisceration. The placing of the incision high is for the purpose of having it backed up by the liver, which normally hangs two or more finger breadths below the costal margin in these young babies. When the liver is pushed up out of the way by the fingers entering the abdominal cavity, these fingers plug the one or one and a half inch opening, should the child struggle. At the end of the operation, the liver drops behind the wound, closing it so that evisceration is impossible. Two fingers introduced through this small opening are wiggled around in the upper abdomen until the olive-like pyloric tumor is felt; this is then lifted to the surface. It is usually found so high and well protected by the over-hanging liver edge that one readily understands why, in so large a percentage of the cases, the tumor is not palpated before operation.

The first assistant holds the stomach side of the tumor steady and the operator's left hand holds the duodenal side of the tumor. The anterior surface of the tumor is inspected and, if necessary, slightly rotated so that the most avascular area is uppermost. One area can always be found in which an incision can be placed so that a minimum amount of bleeding will follow. It is very desirable to make the incision in such an area, as control of bleeding from these edematous cartilage-like tumor edges is not easy. If there is more than a normal amount of oozing, very small tabs of cotton or gauze on a hemostat are dipped into boiling water and immediately applied to the bleeding point, being careful not to let any of the hot water run over the peritoneal surface. Remember always a young baby will stand rough handling better than the loss of even a very little blood.

The incision is made longitudinally in the avascular area, as above described, and will average about one inch in length. A moderate amount of muscle wall is divided and with a pair of Kelly hemostats the incision is spread by opening them. If this incision is deep enough, the muscle wall will separate from the undivided mucosa beneath it at the cleavage line which exists between the muscle and the mucosa. The separation is made along the entire length of the incision, exercising particular care in this separation at the duodenal end. Reference to the picture will show the reason necessary for this care as there is a sulcus around the duodenal aperature into which one may cut unless extremely careful.

It is better to leave a few circular fibers of the pyloric muscle undivided at this point than to divide all fibers and with the last stroke of the knife make a buttonhole into the sulcus referred to. Making of this opening is not fatal if recognized, but if unrecognized, it is fatal. It may be possible to close the opening without narrowing the already small lumen of the duodenum to such an extent as to impair the value of the operative procedure, but a majority of those who have had this accident have thought it wise not to take a chance and have been forced into that technically very difficult operation, gastrojejunostomy, which is, in a six-pound infant, a vastly different procedure from a gastrojejunostomy in a hundred and fifty-pound adult.

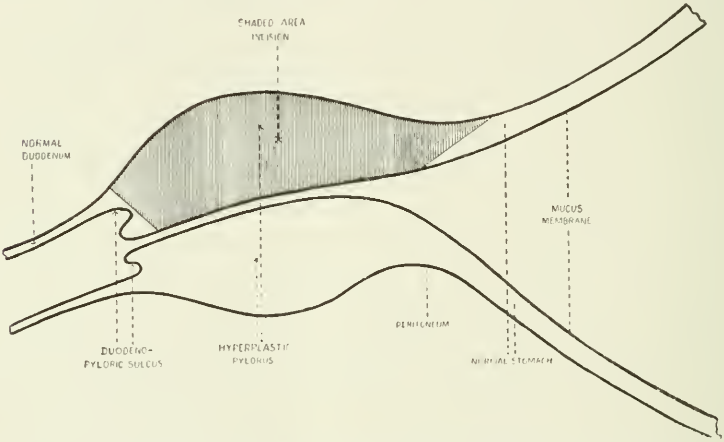


Fig. 1. The separation is made along the entire length of the incision, particular care being exercised in this separation at the duodenal end. The picture shows the reason necessary for this care, as there is a sulcus around the duodenal aperture into which one may cut unless extremely careful.

When one is satisfied with the hemostasis and the amount of muscle divided, the pylorus is dropped back into the abdomen without further treatment. There is a tendency on the part of some to feel that it is poor surgery to leave unprotected an incised peritoneal surface with bulging mucosa, and I must confess to considerable temerity when I first did it. There are practically no references in literature to late complications, although I have had one case in which adhesions may have formed from such treatment. This was in the case of the only colored patient I have seen with pyloric stenosis and the infant was deeply jaundiced at the time of operation. A Fredet operation was made with a good result for about two weeks. I went off duty at the

City Hospital, and according to the rules of the hospital, I could not follow the case. Dr. Carl Hiller was on duty and it became necessary for him to re-open the abdomen and make, I am told, an anterior gastroenterostomy. Dr. Hiller said there were numerous adhesions of the pylorus to the under surface of the liver, which were so dense that he did not feel justified in dividing them. I am not able to understand why these adhesions formed unless the fever and jaundice indicated the presence of an inflammatory process in the liver or duodenum. I do not believe that these adhesions can be attributed to a fundamental fault in the operation. This baby is the only one in whom a secondary operation has been necessary. The Fredet operation can be done in as short a time as twelve minutes including opening and closing of the abdomen. So simple an operation carries with it practically no risk of shock.

The closure of the abdominal wall has been the source of some considerable worry. There seems to be a tendency on the part of wounds made in these malnourished children to resent the introduction of foreign material. I have tried various methods of closure and have lately been using a No. 1 ten day chromic catgut for the several layers of the abdominal wall with two or three figure of eight silk-worms to close the skin and as stay sutures in the fascia. The later cases have practically had no induration or serum discharged from the wounds. No case has had an infected wound in the sense that there was pus present, but many of the earlier cases did have induration and a serous discharge.

The post-operative care is comparatively simple from the surgical view point. It is very desirable to give sterile water by mouth with a medicine dropper within a very few hours after the operation. By evening time, a diluted milk, preferably human milk, can be given in quantities of one ounce at one-hour or two-hour intervals. A few drops of water given between these feedings with a medicine dropper usually stops any crying that occurs; very rarely is an anodyne necessary.

A few of the children have had an unusual amount of bleeding a few hours after the operation. In each of these cases a cubic centimeter of hemostatic serum, repeated two or three times, has satisfactorily controlled this tendency to bleeding. No case has given evidence of intraabdominal bleeding.

The morning after the operation a good dose of castor oil cleans out the gastrointestinal tract in a better way than any other cathartic, and usually from that time on there is little or no vomiting though there may be occasionally a tendency to regurgitate for a few days. The last case on which I operated vomited for about 36 hours as much as half of what was taken in; then it regurgitated a little but in spite of the vomiting and regurgitation above mentioned, the baby gained 19 ounces in 13 days. Several statistical tables are appended to show various phases of my cases.

CASES WITH CLINICAL DIAGNOSIS OF CONGENITAL PYLORIC STENOSIS

All cases to March, 1922		50	
Not operated upon		8	
Operated upon		42	
Diagnosis correct		39	
Diagnosis incorrect		3	(1 case of rumination; 1 case of duodenal ulcer; 1 case of acidosis.)
At time of operation or consultation—			
Average age		52½	days
Youngest		17	days
Oldest		124	days (died post-operative)
Less than birth weight............		80%	
More than birth weight..........		20%	
Had gained before starting to loose		50%	
Condition poor	18	38%	(17 operated upon [1 death]; 1 pre-operative death.)
Condition fair	14	31%	(12 operated upon, all alive.)
Condition good	15	32%	(10 operated upon, all alive.)
Specific history	2		These cases not operated upon.

SYMPTOMS IN CASES OF CONGENITAL PYLORIC STENOSIS

First born		56%	
First born, males		50%	
Males, 37		79%	
Females, 10		21%	
Feeding changed from breast feeding to artificial food..........		54%	
Fontanels sunken in all cases in poor children		38%	
Urine scant, in all cases in poor condition		38%	
Fever high in about ½ cases in poor condition.			
Waves seen	48	96%	of all total 50 cases.
Waves not seen	2	4%	(Case of rumination; stenosis case, 124 days.)
Tumor palpable	16	33%	
Tumor not palpable	25	55%	
Tumor doubtful	6	12%	
Vomiting explosive seen or in history	48	96%	
Vomiting not explosive seen or in history..........	2	4%	(Rumination case and ulcer case.)

Subsequent Condition of 50 Cases Clinically Diagnosed Congenital Pyloric Stenosis.

Cases living	47
Death before operation could be made	1
Rumination or merycism case operated upon. (Died 16 days later)	1
Congenital pyloric stenosis case (124 days old), operated upon (died few hours later)	1
Cases not operated upon	8
Confirmed diagnosis at autopsy	1
Now well and no symptoms (clinical diagnosis only)	4
Now living with some symptoms (occasional indigestion; refuses food, undernourished, etc.)	3

Cases Operated Upon—Diagnosis Correct and Now Living	38
Died post-operative (124 days old)	1
Primary posterior no-loop gastrojejunostomy (all excellent health)	3
Fredet-Rammstedt type of operation	35
Re-operation for later symptoms (anterior gastroenterostomy)	1
Last heard from—excellent health—Fredet operation	34
Last heard from—living but not doing well—Fredet operation (occasional vomiting and under weight)	1

Convalescence of 38 Operation Cases Living

Vomiting first 24 hours—gastroenterostomy		2
Vomiting first 24 hours—Fredet operation		20
No vomiting first 24 hours—gastroenterostomy		1
No vomiting first 24 hours—Fredet operation		15
Regurgitation for few days		16
Wound bled post-operative (only 1 serious)		6
Wound re-opened, due to failure of healing		0
Wound infection		0
Wound reddened and serum oozing		60 + %
Operation cases, proven diagnosis, health excellent	37	95%
Operation cases, proven diagnosis, dead	1	2½%
Operation cases, proven diagnosis, poor health (sulcus accidentally opened)	1	2½%

As a result of my surgical experience with these cases, I feel very positively that the indications for radical surgical interference have broadened and increased at the expense of that group we have formally treated medically. I believe the border-line case about which we might argue as to whether to continue medical or resort to surgical treatment should now always be surgically treated. The contra-indications to medical treatment have grown, as surgical interference has become more safe, so that today, in these border-line cases, one can honestly say that the medical dangers are greater than the surgical dangers. The reason for this latter statement is that there is a very great uncertainty as to the possibility of cure by medical means. Dangers of concurrent infections, intestinal or general, added to the nutritional problem are ever present and are more apt to prove fatal because of this latter problem.

A small percentage of cases will be handicapped in the years of adolescence or even into adult life by the abnormally narrow pyloric aperture. Prolonged worry and anxiety on the part of the parents, or others responsible for the child, with the protracted wear and tear on their nervous systems, is not balanced by any added safety to the child. In the family of the working man, the problem of the medical care for months of such an infant becomes almost insurmountable.

For these reasons, I believe the border-line case should be referred to the surgeon. The well developed case must be referred to the surgeon.

BIBLIOGRAPHY

1. Palmer, D. W.: Congenital Hyperplastic Pyloric Stenosis, Ohio State M. J., XII, 730 (1916).
2. Palmer, D. W.: Hyperplastic Pyloric Stenosis, Ann. Surg., LXVI, 428 (1917).
3. Palmer, D. W.: Hyperplastic Pyloric Stenosis of Infancy, Trans. of The Association of Resident and Ex-resident Physicians of Mayo Clinic, 1, 74-83 (1919).
4. Benjamin, J. E.: Report of 19 Cases of Hyperplasia of Thymus Gland Treated by X-rays, ARCH. PED., XXXV, 70 (1918).
5. Blackfan, K. and Little, Carl: Am. J. Dis. Child., XXII, 459 (1921).

TUMORS IN CHILDREN (Archives Españoles de Pediatría, Madrid, Jan., 1922). Nogueras comments on the different location of tumors in children from the locations in adults, the predominance of sarcomas, the greater incidence in boys, and the lesser tendency to cachexia and to recurrence. He refers to D'Espine and Picot's recent compilation of 577 cases of malignant tumors in children, supplementary to Duzan's compilation of 182 cases. He then adds a few cases of tumors in children from his own practice. In one girl of 7 a palliative operation on a periosteal sarcoma on the fibula was followed by pronounced debility and the tumor increased rapidly in size. The leg was amputated and prompt recovery followed, although there is still an enlarged gland in the inguinal region. In another case a lipoma on the fibula of a boy of 9 was successfully enucleated. It weighed 785 gm. In three other cases a hydatid cyst in the neck was successfully treated. In one of this group the cyst had ruptured in a fall, and this had induced symptoms of severe anaphylaxis for a time. When the cyst had filled out again it was removed.—*Journal A. M. A.*

A PURITAN PRACTITIONER.*

By Nellis Barnes Foster, M.D.

New York.

The little town of Boston in 1721 does not suggest itself as a place of medical drama, yet there was enacted, during that year, one of the significant events in the history of medicine. During its existence the settlement had been beset chiefly by two enemies, the Indians and small-pox. There had been no less than five epidemics and some of these had threatened the very existence of the community. In the early spring, small-pox had again made its appearance and thoughtful citizens were alarmed. A curious coincidence occurred at about this time; two Italian physicians, Timoni and Pylarini, had been travelling in the Orient and both of them had been struck by a method used among the Turks to induce small-pox artificially. These physicians made reports to the Royal Society of London, more or less, it is surmised, as a curiosity in oriental customs. The copy of the transactions of the Royal Society which contained these reports fell into the hands of Cotton Mather. The way in which these reports came into Cotton Mather's hands is one of those curious little incidents sometimes cited as the irony of fate. That William Douglas, a graduate in medicine in the University of Edinburgh and a correspondent of the London Society, should not be struck by the content of his journals and that a minister of the Gospel should see in these same journals the facts which stimulated his imagination we cannot readily explain. Cotton Mather had before this evinced an interest in matters pertaining to health, as witnessed by some of his writings, "The Discourse on Recovery from Sickness"; "Wholesome Words . . . A Visit of Advice Given Unto Families That Are Visited With Sickness"; "Insanabilia, An Essay Upon Incurables, Aimed at the Comfort and Counsel of Many Who Encounter Things for Which There Is No Remedy But Patience." Endowed with this turn of mind, it is not surprising that Cotton Mather found in the reports of inoculation for small-pox, published in the Transactions of the Royal Society, a suggestion for the relief of his colony, dire pressed by the menace of an old enemy.

---

*Read before the Clinical Research Society, New York, May, 1922.

Mather wrote a letter to the physicians of Boston setting forth to them the possibility, as he saw it, of ameliorating the threatening plague. This letter ends, "Gentlemen, my request is that you would meet for a Consultation upon this occasion and to deliberate upon it, that whoever first begins this practice (if you would approve that it should be begun at all) may have a concurrence of his worthy Brethren to fortify him in it." Nothing came of this appeal. We may surmise that Doctor Douglas, whose book Cotton Mather had borrowed, was perhaps piqued that a mere clergyman should in this way advertise its contents and not appeal directly to him as the proper person to execute so heroic an experiment. In any case, no reply came from the physicians of Boston and it is possible that Douglas was exerting his influence against any such action.

In the meanwhile, the epidemic was spreading rapidly and the danger became daily more real. The guards, which had been stationed at the houses of the infected, by order of the selectmen, were removed as useless. Cotton Mather is filled with anxiety and writes on June 13th, in his diary, "What shall I do with regard unto Sammy? He comes home when the small-pox begins spreading in the neighborhood, and he is loath to return unto Cambridge." Again on June 22nd he records in his journal, "I prepare a little treatise on Small-pox, First Awakening of the Sentiments of Piety which it calls for, and then exhibiting best Medicines and Methods which the world has yet had for the managing of it and, finally, adding the New Discovery to prevent it in the way of Inoculation. It is possible that this Essay may save the Lives, yea, and the Souls of many people. Shall I give it unto the Booksellers; I am waiting for Direction." On June 23rd he notes that he writes letters to the physicians regarding inoculation. One of these letters was sent to Zabdiel Boylston. It would not appear from any record that Boylston had been one of the prominent physicians of Boston up to this time. He was the son of a physician and apparently had been instructed in medicine by his father. He was not a graduate of Harvard College; indeed it is alleged that he was chiefly known as a cutter of stone, though this may have been said by his detractors. However modest his reputation may have been, he seems to have been impressed by the need of his community and by the possibility of relief offered in the inoculations which Cotton Mather suggested to him. Fortunately, he was a man of prompt decision, since on the 26th of June, 1721, he inoculated his son Thomas, 6 years of age, and his 2 negro slaves, Jack 36 years old, and Jacky, a child. Boylston could not try the experiment on himself because he had already had small-pox in 1702.

A storm of protest and popular indignation immediately broke forth in Boston, which divided the little community into two contending camps. Although all three of Boylston's patients recovered, yet, as Hutchinson the historian says, "The vulgar were enraged to that degree that his family was hardly safe in his house . . . many sober, pious people . . . were of opinion that, if any of his patients should die, he ought to be treated as a murderer." Boylston received no support from his own profession; if any believed in the method they were either lukewarm or restrained by prejudice and fear. Doctor Douglas was active in organizing the opposition and by every means, fair and foul, endeavored to prevent the method receiving general acceptance. Boylston was, however, not wanting in supporters and, despite the clamor, went on quietly inoculating those individuals who applied to him for it. The selectmen called together the medical faculty of the community and got from them the expression of their opinion regarding the method, of which the following is one paragraph: "That the natural tendency of infusing such malignant Filth in the Mass of Blood is to corrupt and putrify it, and if there be not a sufficient Discharge of that Malignity by the Place of Incision or elsewhere, it lays a Foundation for many dangerous Diseases." Further inoculations were forbidden by the selectmen, but Boylston proceeded "in contempt of the magistrates and contradiction to the practitioners." In fact, we must suppose that the opposition of the profession, and indeed of the law, did not seriously embarrass his activities, but in that community public opinion was largely formulated in the pulpit and from the pulpit he received his denunciation as well as his inspiration. The practice was denounced by the clergy as immoral. Sermons were preached for those who entertained scruples of a conscientious nature. Conscience then, we must recall, was a moving spirit to a degree little understood at present. Consider such texts as the following for sermons against this new "Devil's method"—"That it is not lawful for me to make myself sick when I am well"; "What then, will you not wait God's time for it?"

"Can't you trust God?" "God has predestined and fixed the period of everyone's life, beyond which nothing should protract it, so that, if this time be come, inoculation will not serve." But the most convincing argument from a pulpit is the following, delivered on a Sunday, July 8th, 1722:—"Could then these bold Practitioners lessen the Severity of the Disease, could they entirely secure Men from Danger under it, could they say to the Distemper, as Almighty God does to the Proud Waves of the Sea, 'Hitherto shalt thou come but no further,' could they, I say, do all this, I do not see what Good Mankind would get in the main. They would, it is true, have one Danger less to fear but that would be no real kindness forasmuch as it would be the Occasion of their running into a great many more and, if they should happen to be more *healthy,* 'tis great *chance* but they would be *less righteous.*"

We must not believe that this was a mere dispute of words; it came to a near bloodshed. The Reverend Mr. Walter, of Roxbury, was inoculated at the home of Cotton Mather and, while he was still sick, at 3 o'clock one morning, a bomb was thrown into his room. But the fuse became detached. The bomb did not explode. Tied to the bomb was a scurrilous message to Cotton Mather. It is stated that Boylston was on several occasions assaulted in the street.

We do not know how much influence the press exercised, but one journal at least we are surprised to find in the opposition, the New England Courant, which was published by James and Benjamin Franklin. But it is gratifying that at a later date, after the death of his son, Benjamin Franklin states publicly his "regret that I had not given it to him by inoculation" and, at still a later date, Poor Richard argues for prevention in a familiar way by speaking of a recent epidemic in which a number of people had lost their lives, "64 of the number were negroes; if these may be valued at £30 per head, the loss to the city in the article is near £2,000."

We can only imagine that Cotton Mather hardly exaggerated when he states, in his diary August 24th, "the Town has become almost an Hell upon Earth, a City full of Lies and Murders and Blasphemies."

During the course of this epidemic Boylston inoculated 244 persons; in Cambridge, 25 were inoculated; in Roxbury, 11. Of the 280 inoculated persons, 6 died, a mortality of 1 to 46, in contrast to 1 in 6 or 7 of those who had become diseased through contagion.

Boylston's reputation had come to the attention of Sir Hans Sloane, who was president of the Royal Society of Physicians in London, and, after the epidemic in Boston, Boylston spent some time in London, where he wrote his Historical Accounts.

There is little to add concerning Boylston's subsequent life, When he returned to Boston he seems at once to have been recognized and he enjoyed the confidence and the respect of his community and finally retired to a farm in Brookline.

This little drama in Boston, so full of curious conceits it hardly seems real excepting for the ever-present human element, marks one of the earliest organized attempts at preventive medicine and, in its consequences, it is probably not too much to say, led physchologically to the experiments of Jenner a half century later. One cannot help pausing for a moment to wonder how it could have been that a man with the training of Douglas could fail to see an opportunity patent even to one of no scientific training whatsoever. Great discoveries in medicine, as Sir George Baker has said, depend as much upon accident as any other element. Certainly it is a trivial coincidence which attracted attention and led ultimately to productive ideas. There comes to mind those earliest suggestions that the mosquito might be implicated in conveying disease, and these initial steps which lead to the most important truths are very often taken by the humble general practitioner, provided he possesses

"A waking eye, a prying mind,
A hawk's keen sight ye cannot blind."

Perhaps in this age less than any other but still in this age, we are too prone to forget the first object of medicine. Confused by what seems a multitude of sick about us, and engaged, as a good physician must be, in doing what he can, it is too easy to ignore the larger problem,—for it always is the larger problem—the prevention of disease. Something in the genius of the Anglo-Saxon has made preventive medicine his particular field. Vaccination and anticipative surgery are fit examples.

It is enheartening to take stock where we stand today with regard to our means of prevention of disease. In the case of some diseases all of the scientific data necessary for prevention are available. This is the case regarding small-pox, typhoid, cholera, yellow fever and probably typhus fever. That some of these diseases menace parts of the world is due not to insufficient knowledge but to economic or social factors. When one thinks that some of these diseases were the plagues of the middle ages and that our knowledge of the means of control has very largely been gained in the last centry, the result is nothing less than astounding.

I have mentioned only those diseases which occurred in epidemics amounting to plagues and in time past devastated countries. We are not apt to think of it but until recently taking the world over, malaria was the greatest plague; for the world it was the Captain of the Men of Death and at the present time it is not too much to say that we are in possession of all the scientific facts necessary for the control of malaria. The immediate causative agent in this disease was known for some time without our being able to make any practical use of it and not until Manson's studies of filaria had incriminated the mosquito as the intermediary host was the key given which unlocked the riddle of malarial transmission and in this instance there is well illustrated the manner in which a single fact may elucidate a new principle. Of course, it had been suggested time and again, even in remote history, that the mosquito could convey disease but, it once having been demonstrated that it was a vector for a specific disease, the methods were uncovered for the study of the mode of transmission of all diseases belonging to certain groups. The logical sequence in this case was filaria, malaria, yellow fever and in the case of the last, yellow fever, the mode of conveyance was known long before the virus responsible for the disease.

When one considers what has been accomplished under conditions which were adverse, so far as limitation of equipment and monetary support for elaborate experiments, we may be forced to wonder that there are still problems for solution. Only five years ago an epidemic swept this country, the magnitude of which was so terrifying that the suggestion was seriously advanced that influenza was a form of pneumonic plague. Yet, with ample experience and unlimited facilities we are today quite without means of control. The year before, the prevalence of anterior poliomyelitis was extensive enough to gain the designation of epidemic. Beginning as it did in a few widely separated communities, spreading in an apparently mysterious way, evading every effort at quarantine, it swept over a large part of the country and, should it appear again during the next summer, it is very doubtful if our efforts of control would be any more effective than those in the past. Certainly there has not been want of opportunity for that careful observation which brings the first hint of proper line of attack.

In the development of our knowledge, two things stand out as always necessary; first observation; from this has invariably come the suggestion to be submitted for careful testing. But the observed fact is never alone sufficient. Many had observed that malaria was most prevalent where mosquitoes were abundant. Benjamin Rush remarked that one should sleep in the upper stories of the house to avoid malaria. A ship surgeon recorded that yellow fever did not develop if the bunks were screened. What is necessary in addition to observation is imagination. We sometimes call it *scientific* imagination; but imagination is all more or less alike, and what we mean by scientific is that ability to use facts apparently meaningless for the development of an hypothesis which can be carefully tested under rigidly controlled conditions.

So far as we are able to judge of the characters and personalities of men who have made notable contributions, one is not struck with their unusual power of observation nor indeed did they seem to have, as a rule, peculiar types of imagination. It is, however, striking that the single matter in hand, the isolated fact of today's experience did not absorb them; they seem always to have been looking for a deeper significance. Nothing to them is ever commonplace, no event is a mere episode. And this reveals the difficulty in most of us that in the hurry and in the absorption of the ever present task, our minds become stereotyped, as Oliver Wendell Holmes said, "polarized." We are like Peter Bell,

"A primrose by the river's brim
A yellow primrose was to him
And it was nothing more."

The peculiarity of scientific knowledge is that while never complete it constantly remolds human thought. One step in advance prepares the way for the next. Boylston's experiments in Boston stimulated inoculation in England. The support of Queen Carolyn,* whom Voltaire designated a "philosopher on the throne," smoothed out many prejudices. All this experimentation and discussion created a state of mind.

---

*Lady May Worthy Montagu, wife of the British Ambassador to the Porte, had had her three-year-old son Edward, inoculated by a Greek woman with Maitland's assistance. After Lady May's return to London from Constantinople, in 1721, she caused her daughter, the future Lady Bute to be inoculated. It was the attitude of Lady May which largely influenced Queen Carolyn.

Now in Gloucestershire a notion had prevailed from remote times that the milkmaids who contracted cowpox were immune to small-pox. This superstition, as it was considered, was known to Jenner from his youth; he saw something deeper than others saw and sought the council of his former master, John Hunter, who gave his famous reply "Don't think, try." About 1770 he began to keep records of cases of cowpox and their subsequent course and immunity to small-pox. But not till 1796 did he feel that his data warranted the first vaccination. Again we see the same factors producing a discovery; patient observation and then the controlled experiment.

Now as always Science must hold with Epichasmus that judicious distrust and wise scepticism are the *sinews* of the understanding, but its spirit is an open unprejudiced mind. Even a superstition may carry the seed of a great truth.

FOREIGN BODIES IN THE DUODENUM (Archives de Médecine des Enfants, Paris, June, 1922). Veau exposed the duodenum of an 11 months infant who had a safety pin arrested at the spot, the point upward. He did not venture to cut into the duodenum, but merely manipulated it to dislodge the safety pin and squeeze it shut. Attempts to force it along failed. The safety pin was found in the stool the sixty-fifth day after the operation, the eighty-third after it had been swallowed. He summarizes 21 operative cases from the literature, and 10 others in which the foreign body was found in the duodenum at necropsy. The foreign body was a safety pin in only 4 of the cases, and only 8 of the patients were children. In 7 cases the duodenum was incised, with one death. A gastro-enterostomy completed the operation in one case. In the 6 cases with peritonitis already installed, 50 per cent. died. With infants, an incision across the fibers of the rectus gives more material for suturing. Evisceration should be avoided in infants, as this entails shock. The suture threads should be left unusually long, up to twenty-one days. The foreign body was worked back into the stomach in 6 cases, with recovery in 4; in the fifth case the perforation of the duodenum had escaped detection.—*Journal A. M. A.*

THE DIAGNOSIS OF NASAL SINUS DISEASE IN CHILDREN

By H. B. Lemere, M.D.
Omaha, Nebr.

Up to the beginning of this century, the recognition of disease of the antrum of Highmore in children and infants was confined to those severe cases of suppuration which, involving the bone, broke through the cheek, forming fistulæ. Emil Mayer[1], in reporting such a case in 1901, states that there were at that time not more than a dozen other cases reported in the literature.*

The prevalence of sinusitis in children, however, was recognized by pathologists of that time. In 1900, Harke[3] stated that in 30 post-mortem examinations in cases of croup, diphtheria, measles, whooping-cough, scarlet fever and chicken pox, not one was free from suppuration of the nasal accessory cavities, the antrum being most frequently affected. Twenty years later our clinical observations and interpretations have verified the findings of this observer, which, however, apparently made little impression on the conception of the prevalence and origin of sinus disease at that time. The improved knowledge and technic of the x-ray since then and its increased use has more than any other one factor stimulated investigation of the sinuses.

In 1914, Oppenheimer[4], writing on children, says that many instances of post nasal catarrh are but evidence of inflammatory condition of the adjacent sinuses and states that maxillary sinusitis is too often unrecognized and treated as nasal catarrh.

Skillern[5] infers that there is a mild grade of sinusitis in children in which treatment other than operation would be successful. He says that the condition when advanced indicates that there has been a previous stage when conservative treatment would have been effectual.

Dean[6], in conjunction with Byfield[6], has crystallized our ideas into a very definite form by this classical study on sinusitis in children.

Still later, Cleminson[7] has given us a study of the milder grades of sinusitis in children and the opinions expressed in these two papers represent clearly the modern conception of sinusitis in children, in both its mild and severe forms.

---

*In 1921, Vernienwe[2], in writing of this form of maxillary sinusitis in the newborn, says it may have three portals of infection, 1. the nose, 2. the mouth and the teeth buds, 3. the orbit and lacrymal route, the last being the most frequent.

The symptomatology is interesting to general medicine in that almost all the symptoms are general in character so that only incidentally will these patients be considered nose and throat cases. The pediatritian and family doctor will be the first to see them and only insofar as they are recognized by them will the rhinologist be consulted. On the other hand, the rhinologist must be familiar with the later studies and means of diagnosis and with the modern conception of nasal infection, if he wishes to be of service. Dean's studies were pushed to their successful conclusion by the stimulus of the demands of Byfield, the pediatritian. Cleminson's symptomatology of sinusitis in children consists almost entirely of general symptoms which the pediatritian will first see and will later request an opinion from the rhinologist. His observations were made at the Evelina Hospital for Children, the Golden Square Throat Hospital and the Middlesex Hospital. Progress in the knowledge of this important primary focus of infection can be made only by the closest intelligent cooperation between the pediatritian and the rhinologist and particularly must most of our increase in knowledge come from their closest cooperation in children's hospitals.

It seems to me that the reason that this most important element in children's health has been neglected is that the pediatritian has considered it a pure rhinological problem, whereas the initiation of the diagnosis must come from the pediatritian in almost every instance. He is the one who will be consulted by the parents for the persistent cough, the lack of initiative, the manifest anemia, the arthritis, the chronic digestive disturbance, the hypersensitiveness and irritability, the poor progress in school, the loss of appetite, the headache and dizziness, the cold chills up and down the back.

I have been struck by the extreme nervousness of these little patients. They are much more suspicious and afraid than the normal child. They view with apprehension all shining instruments and often one will have to content himself at the first examination with just what he can see with a head mirror without any specula or tongue depressor until confidence is established. Except in the acute infections there is no tenderness over the antrum itself nor does the child ever complain of its nose.

The objective signs are, however, easily detected and many of them also will be given by the parent. In children the antrum is the sinus more fully developed and is much more frequently the seat of infection than the other sinuses.

The symptoms of latent sinus infection in children are almost entirely subjective. In children under seven years, headache is rarely complained of and even in older children it is not nearly so constant a symptom as in the adult. When it exists and a description can be obtained from the little patient, it is typical of the true sinus headache. Frontal and occipital headaches are the rule even when the antrum is the only sinus affected. Pain and tenderness over the forehead are frequently the main symptom of antrum disease. I consider the condition of the posterior pharynx of very great importance in the determination of the existence of sinus disease. A persistently red and swollen posterior pharyngeal wall, where it is posterior and internal to the posterior tonsillar pillar, is almost pathognomonic of sinus affection. This is particularly true if the adenoids and tonsils have already been removed. The throat is seen as a reddened membrane thrown into many vertical folds on the act of gagging. Pus or mucopus can be seen adhering to it or dropping from above. The redness of the pharynx is almost universally referred to as a pharyngitis and is observed frequently. I think it can be safely said that if adenoids and tonsils can be excluded every such pharyngitis is but a manifestation of a primary sinus disease and that emphasis should be placed on the infected sinuses, and local treatment should be directed mainly to the source of the infection in the nasal sinuses.

The nose shows swelling of the turbinates. They may be red but are often pale and somewhat waterlogged in appearance. Quite young children may have the opposite condition of wide patulous nose with somewhat shrunken turbinates and a scant transparent secretion without scab formation. The secretion has a faint odor which, if it were more in evidence, would be intensely disagreeable. In such children I have seen marked nervous manifestations but as they never had profuse discharge nor stuffed up heads they were supposed by their parents to be free from head infection. The odor in these cases indicates a low grade infection in the bone itself. Acute infection in these atrophic noses sometimes produces severe febrile and toxic symptoms whose origin is never suspected.

The discharge in sinusitis is usually mucopus in which pus or mucus predominate in varying proportions. Owing to different conformations of the nose and the placing of the ostea of the antrum, the discharge sometimes is in evidence in the nostrils and anterior portions of the nose and sometimes discharges mainly into the pharynx. Frequently the discharge is only dislodged and becomes evident after the posterior nasal spray with compressed air has been used when it is expelled in quantities. The discharge in little patients of the asthenic type is often exceedingly scant unless excited by the activity of an acute attack, and while a profuse nasal or postnasal discharge always means a sinus involvement, the apparent lack of it by no means rules out an infection. I have frequently made a tentative diagnosis of sinusitis when operating under ether on children for tonsils and adenoids. Under the stimulation to the mucus membranes produced by the ether the sinuses discharge profusely and large quantities of mucopus are discharged from the anterior nares on to the face or by the posterior nares into the throat. After remarking this at operation, I always ask that these children return for observation for several months as I generally find that the first beneficial results of the tonsils and adenoid operation are not maintained owing to the coexisting sinus affection.

The problem of the treatment of these milder cases of sinusitis does not permit the taking of numerous blood counts so that the condition of anemia is determined by the clinical signs of color of the lips and cheeks rather than by laboratory findings. The lips are pale and sometimes dry and cracked, the cheeks are pale and the skin around the eyes has bluish color. The face, especially with children a little older, is of a dirty color and pimply. An acne eruption will suggest a nasal infection as its cause.

The submaxillary and cervical glands can be palpated and during an attack are visibly swollen. The tonsils if present show disease and enlargement. There is a general listlessness, loss of appetite, nervous irritability and loss of weight. The facies, even in patients in whom the adenoids have been removed, correspond so well to the standard description of the adenoid patient that it is doubtful how much of this classical picture is due to the accompanying sinus infection rather than to the adenoids.

Otorrhea may be present and has a very close relationship to chronic antrum infection. On my service at the University Hospital, the x-ray almost invariably showed cloudy antra in children coming to mastoid operation and in my private practice, I frequently observe the connection of acute and chronic middle ear suppuration to chronic antrum conditions. The antrum infection is the primary one and may exist for years before the ear involvement. Cough, sometimes so persistent as to keep the parents up for nights in succession, and attacks of asthma, in children, always suggest a sinus infection. The almost instantaneous manner in which these symptoms often disappear simply from treatment of the sinus disease, strongly suggests that the bronchial pathology is mainly secondary to the sinus disease.

Mullin[8] states in conjunction with his work with Webb that bronchial infection is usually in proportion to the amount of sinus involvement present, and that a study of the histories in a series of cases showed that the majority of them started with nasal trouble and cough during childhood.

Wilhelm Stepp[9] also calls attention to the connection between the nasal accessory cavities and bronchitis and also their relation to pulmonary tuberculosis and states that the antrum of Highmore is almost always diseased. He adds to his experience that of the late Adolf Schmid that certain gastrointestinal infections rapidly disappeared after accessory sinuses had been treated.

One of my little patients developed an empyema of the pleural cavity which the pediatritian thought was the result of a chronic antrum infection which had been recognized in this patient for over a year previous to her empyema.

The evidence provided by the x-ray only reaches its maximum value if interpreted by one who is familiar with the clinical findings. I often find a definite opinion as to the meaning of the x-ray picture given by those who are not familiar with the routine of nose and throat examination. These opinions, as they fail to take into consideration clinical findings and the underlying pathology, are very often misleading. The x-ray properly read with a knowledge of the clinical symptoms and of the pathology of the nose and of the stage of development of the sinuses, is one of our most reliable means of diagnosis.

It is rarely that we find all the above signs are present in any child but the presence of one outstanding symptom is of more importance diagnostically than is the absence of many.

This paper is on the diagnosis of this condition but I may be forgiven if I say an encouraging word on treatment. The recognition of mild sinusitis in children is too recent to form any estimate as to the best methods of treatment and their results.

This subject is still comparatively unexplored but so far it has been my experience that these mild cases of sinusitis can be very greatly benefited by simple local treatment without operation and the symptoms at least temporarily held in check, while the child proceeds along normal and healthy development. This does not apply to the marked purulent conditions with progressive secondary symptoms, in which operation is indicated.

The fringe only of this subject has been touched. These few remarks on the symptomatology will be wonderfully amplified when our friends, the pediatritians, begin to associate the many symptoms which arise from head infections with antrum infections of children. They will supply us with a complete symptomatology and general treatment and we must supply an adequate local treatment.

BIBLIOGRAPHY

1. Mayer: Med. Rec., Aug. 10, 1901.
2. Vernienwe: Rev. de laryngol, etc., Paris, Sept. 15, 1921.
3. Harke: Bertrage zur Pathol u. Ther. der Oberen Athmungswege Weisbaden, 1895; Nasal Suppuration, 1900. Quoted from Emil Mayer's Article.
4. Oppenheimer: Med. Rec., Feb. 21, 1914.
5. Skillern: Accessory Sinuses of the Nose, Lippincott, p. 100.
6. Dean and Byfield: Univ. of Iowa Studies, Vol. 11, No. 1.
7. Cleminson: J. Laryngol, Rhinol. and Otol., London, Nov., 1921.
8. Mullin: Ann. Otol. Rhinol. and Laryngol., Sept. 1921.
9. Stepp: Deutsch. med. Wchnschr., No. 3, 1921.

AORTITIS IN A CHILD (Rivista di Clinica Pediatrica, Florence, Oct., 1921). In connection with a case in a boy of 7, with two aneurysms in the arch of the aorta, Pincherle and Dalla Volta review the bibliography on aortitis, atheromasia and ectasia of the aorta in children. They have thus compiled over 100 cases. Among the more common causes recorded are syphilis, rheumatism, various acute or chronic infections, toxic action (principally alcohol) or endotoxins (especially from kidney disease). In the case personally observed, the child had chronic nephritis. —*Journal A. M. A.*

IMMUNIZATION AGAINST MEASLES*

By Charles Herrman, M.D.
New York

As a number of papers have been published recently on the prophylatic treatment of measles with the serum of patients convalescing from the disease, I shall discuss this subject briefly before taking up my own method of immunization.

One attack of measles protects the patient against future attacks. This it does by virtue of immune bodies developed in the blood during the course of the disease. The method of prophylactic inoculation is briefly as follows: One week after defervescence from measles, that is, about ten days after the appearance of the eruption, from 60 to 80 c.c. of blood is withdrawn from the vein of an otherwise healthy child over three years of age. The serum is separated, a small portion is subjected to the Wassermann test, and a small quantity of tricresol is added to the remainder, as a preservative. If possible, the serum of several patients is mixed. The material is kept in sealed vessels, in a cool place. For prophylactic inoculation from 3 to 6 c.c. of the serum is injected intramuscularly not later than the fourth day of the incubation period, which is usually the second day from the appearance of the eruption in the primary infecting individual. The chief objection to this method is that it confers a *passive* immunity which lasts only about eight weeks, and that this immunity is not absolute for that length of time, as the following published reports demonstrate.

Torday..........	261	prophylactic	inoculations	with	15	failures
Manchot	155	"	"	"	11	"
Kutter	145	"	"	"	6	"
Kleinschmidt	60	"	"	"	2	"
McNeal	16	"	"	"	4	"

That is, in a total of 637 inoculations, 38, or about 6 per cent., failed to protect. The method has only a limited application, namely in asylums, and other institutions for the care of infants and young children, where, when a case of measles occurs, the remaining children may be given prophylatic injections. As

---

*Read before the Eastern Medical Society, May 12, 1922.

Rietschel has pointed out it is difficult to obtain a sufficient amount of blood from convalescent children, especially when the parents' consent must be obtained. In such cases I believe a simpler plan would be to use the blood of one or both parents, and if time allowed, its potency could be increased by inoculating them with measles virus a week or ten days before withdrawing their blood.

The prophylactic inoculation with convalescent serum, of children who are known to have been exposed to infection with measles, is only a very small contribution to the solution of the measles problem. Outside of institutions the vast majority of children are infected at a time when no one suspects the danger.

In the discussion of a paper on "Measles Experimentally Produced" read by Dr. Blake at the New York Academy of Medicine on February 3, 1921, Dr. Ewing (Arch. Ped. 38, 96, 1921) said, "Satisfactory and convincing as this study is, I should like to point out that it is a further duty of Dr. Blake and his co-workers to attempt to make the work of practical benefit. One characteristic of modern science is that it does not concern itself sufficiently with practical results. Jenner's work was not conducted in a way that we today would consider strictly scientific, yet he was successful in transforming smallpox from a lion into a cat, though its cause was still undiscovered. So, while we know a great deal about measles, the first step is to find how, by harmless inoculation, the disease can be prevented."

In April 1914, I began to inoculate against measles. The method depends on the following facts:

1. Seventy five per cent. of the deaths from measles occur in infants under two years of age, and ninety per cent., under five years.
2. Any method of immunization, which aims to control or eradicate the disease, must be employed in early infancy on all or nearly all children.
3. Infants, whose mothers have had measles, are relatively immune to the disease during the first five months of life. This immunity gradually disappears, but in many it persists for six to eight months. The immune bodies in the mother's blood are probably conveyed to the fetus through the placental circulation. Artificially fed, as well as breast fed, infants enjoy this relative immunity. It is not conveyed to any great extent through the

breast milk, for infants of six or more months, who are still nursed, are just as susceptible as artificially fed infants. I always believed that this relative immunity of infants under five months was an accepted fact. In a paper which I published in 1914 (Arch. Ped. 31, 890, 1914), I stated that "I have notes of 40 consecutive cases of infants under five months who did not contract measles although they came in very intimate contact with patients, such contact as occurs in the tenements, often lying in the same bed." Since that time I have collected a very much larger number of such cases. In several discussions (Arch. Ped., 38, 101, 1921, and 38, 519, 1921), I stated that I had inoculated 150 infants under five months with the measles virus, and that not a single one had developed a typical attack of measles. One would suppose that this was sufficient evidence that such infants were relatively immune. I was therefore not a little surprised to read in a recently published paper by McNeal (J. A. M. A. 78, 340, 1922), "Herrman attempted to convert the *supposed* temporary immunity of infants under 5 months * * *"

4. In measles the infectious material is regularly present in an active form in the nasal discharge from 24 to 48 hours before the eruption appears.

5. It is not necessary to isolate and identify the infectious material, or to obtain its growth in pure culture, in order to immunize against the disease.

6. In measles, as it occurs in practice, the infectious material is conveyed usually from the nasal mucous membrane of the patient to the nasal mucous membrane of the child infected.

The immunizing inoculations follow the same path. The nasal mucus discharge of patients, free from other diseases, is taken from 24 to 48 hours before the appearance of the eruption. It is mixed with a small quantity of normal saline solution, and bacteria and other extraneous material separated by centrifugalization. If passed through a Berkefeld filter, the microorganisms are eliminated, but the virus loses some of its potency and cannot be depended upon for the purpose of immunization. A little tricresol is added as a preservative. A few drops of this solution are applied to the nasal mucous membrane of the infant to be immunized. Only healthy infants between four and five months are inoculated. The method endeavors to convert the temporary relative immunity into an immunity which persists during the first few years, that is during the period when the disease is most dangerous. I have found that the best results are obtained when there is some reaction following the inoculation. This consists of a slight rise of temperature on the eighth to the sixteenth day; occasionally a few spots on the face or body. It is therefore advisable to inoculate as near as possible to the end of the fifth month.

The chief objection raised to the method has been that a susceptible infant might be inoculated and develop the disease in a severe form. If only healthy infants, whose mothers have had measles, are immunized there is no danger. In 165 inoculations, I have not had a single case which exhibited any unfavorable effect.

RESULTS: One hundred and sixty five infants have been inoculated in the fifth month. Of these, 75 have been followed for from four to eight years. Of the 75, only five have contracted measles, and 70 have remained free. Of the latter, 45 have been directly exposed to infection, 17 by contact with infected children in their own family, 28 by contact with children living in the same house. In 84 of the 165 inoculated, there was a definite reaction, a rise of temperature on the eighth to the sixteenth day, with or without a few spots on the face or body. I have no doubt that if all the infants could have been constantly observed, a larger number would have shown a reaction. None of those showing a distinct reaction contracted the disease. Thirty six of those inoculated, with a reaction following, were re-inoculated after an interval of at least six months, and none developed the disease.

685 *West End Avenue.*

BIBLIOGRAPHY

Degkwitz: Ztschr. f. Kinderh., 25, 134, 1920; ibid., 27, 171, 1920.
Glaser and Muller: Med. Klin., 17, 649, 1921.
Herrman: ARCH. PED., 32, 503, 1915; ibid., 34, 933, 1917; ibid., 31, 890, 1914; ibid., 34, 38, 1917.
Hiraishi and Okanoto: Japan Med. World, 1, 10, 1921.
Kutter: Ztschr. f. Kinderh., 30, 90, 1921.
McNeal: J.A.M.A., 78, 340, 1922.
Maggoire: Pediatria, 29, 873, 1921.
Manchot and Reiche: Med. Klin., 17, 1230, 1920.
Nicolle and Conseil: Bull. et mem. Soc. med. d. hop. de Paris, 42, 336, 1918.
Richardson and Connor: J.A.M.A., 72, 1046, 1919.
Rietschel: Ztschr. f. Kinderh., 29, 127, 1921.
Torday: Ztschr. f. Kinderh, 29, 148, 1921.

ACRODYNIA(?)

Report of a Fatal Case.*

By Clara M. Davis, A.B., M.D.

Cleveland

From time to time, during the last five years, there have been reported in the Archives of Pediatrics and other journals and described under such titles as "Polyneuritic Syndrome," "Acrodynia," "Pellagra(?)," etc., a number of cases of an interesting illness occurring sporadically and in small epidemics in widely separated sections of the country and observed, apparently, only in young children. In addition to involvement of the peripheral nerves, and the more or less characteristic skin lesions, most of the cases have shown a profound anorexia, some involvement of the respiratory tract, photophobia and conjunctivitis, and often a sore mouth. Gastrointestinal symptoms, other than a mild constipation, have been rather conspicously absent.

Although the clinical picture is a reasonably definite one, its etiology and pathology are so obscure, and the clinical picture itself is such a strange mixture of symptoms and signs of various conditions known to be toxic, infectious, or "diet deficiency" in their origin, that in the differential diagnosis arsenic poisoning and pellagra have occurred to more than one observer, while others, among whom is Byfield[1], regard the appearance of these cases so soon after the influenza epidemic, the leucocytosis, the common respiratory infection, and the prompt improvement in some cases after the treatment of infected nasal sinuses or removal of diseased tonsils, as evidence of the infectious origin of the condition.

In the face of such uncertainty, it seems worth while to add to the literature the report of another case, especially as it was of unusual severity and ended fatally. Unfortunately permission for autopsy could not be secured.

Report of Case

On May 6, 1920, S. B., a female child, 2½ years old, was admitted to the pediatric ward of Mt. Sinai Hospital, with complaint that she had had a sore mouth for four weeks, with marked loss of appetite and refusal to take food, and a cough and cold of the same duration.

---

*From the Medical Service of Mt. Sinai Hospital, Cleveland, O.

[1] Byfield, A. H.: A Polyneuritic Syndrome Resembling Pellagra-Acrodynia, Am. J. Dis. Child., 20:347, 1920.

The child's illness was said by the mother to have begun with a cold and cough, and simultaneously there appeared a number of sores in the mouth which caused the child so much discomfort that she was very cross and fretful and refused all nourishment, except milk. The cough had been of a harsh, hacking character, but much thick discharge ran from the nose and down into the throat. Soon after the onset, the child's face became swollen, the eyes began to discharge a thick pus, and an eruption, bright red spots at first and later darker red in colour, appeared on the face, behind the ears, and then on the body and extremities. The mother also noticed that the baby's tongue was somewhat swollen and that her legs and feet became blue and cold. From the first the child was extremely restless and irritable, cried if handled, was at times drowsy, and when awake showed a tendency to talk continuously. No improvement in any of the symptoms had been seen in the four weeks. The mother was quite sure that the child had never had fever. That the respiratory symptoms were most in evidence at first seems probable from the fact that the only prescriptions given by the two physicians called in during the first week were for Brown Mixture.

The family history showed nothing of importance; the child was Russian-Jewish, born in Cleveland; the father and mother were well and had had no recent illness as was the case with four living brothers and sisters (patient was the fifth of six children). One older child had died in Mt. Sinai Hospital the year previously of cardiac disease.

The patient was born at full term by a normal delivery, breast fed for a year, and later given modified milk. Her mother stated that milk was still the chief article of her diet but that she was given other things from the table, and that these other things were of fairly wide variety may be inferred from the fact that twice during her stay in the ward, she asked for a pickle. She had had no illnesses while breast fed, rather frequent colds since weaned, several attacks of sore throat, measles at eighteen months of age, and influenza with bronchopneumonia six months before the present illness. Her appetite had usually been good and she had no gastrointestinal disturbances.

On entering the ward one noticed the child at once, as presenting an unusual picture of wretchedness, in which restlessness, drowsiness, irritability and mental depression were combined. Usually she sat or lay in her bed showing no interest in her surroundings but objecting to everything done for her and occasionally burrowing her head in the pillow, lying on her face with knees drawn up under her.

On examination she appeared quite ill and presented a curious appearance owing to the unsual skin condition, and the extreme edema of the lids. She seemed to suffer great discomfort, if not actual pain, when handled or moved. Her development was normal for a child of her age, emaciation was moderate, and the loss of turgor and dry, intensely red lips indicated some anhydremia. Over the cheeks was a dusky erythema with an occasional spot of darker red. The eyelids were reddened as well as edematous. The skin of the forehead showed many round or oval macules, some of a purplish red, others more brownish in hue, and varying from ¼ to 1 centimeter in diameter. These macules were also abundant under the chin and throughout the hairy scalp but were present in greater profusion in a band around the neck where they were also of a much brighter red, while those on the scalp were uniformly brownish. The ears showed a simple erythema without macules. On the upper part of the thorax and on the arms the eruption was less profuse, but below the level of the nipples was a solid band of dusky erythema completely encircling the lower thorax and upper abdomen and of slightly greater width in the axillæ and posteriorly. Below the band of erythema were macules of the same appearance as on the forehead and neck, becoming less numerous over the lower abdomen, buttocks, and lower extremities, and more purplish in hue. A few were seen on the forearms and backs of the hands. On the palmar surfaces of the latter were fine (pin-head size) bright red macules. The feet had a uniform purplish hue and felt cold. On pressure all redness disappeared from the macules, leaving in some cases, and especially when pressure was made on the wide erythematous band, a dirty brownish stain. Fading lesions showed slight fine desquamation and the entire skin was very dry. At the upper portion of each anterior axillary fold and extending into the axilla were ulcerated areas about 3.5 cm. long and 2 centimeters wide, symmetrical in size, shape and position. These were shallow, flat with no induration or redness of the skin border, and no granulations, showing a scanty, thin grayish purulent secretion.

The superficial glands were not enlarged excepting the post-cervical, a finding explained by the presence of pediculosis on admission.

The lips were bright red, showed some sordes, were cracked and bled easily. The oral and pharyngeal mucous membranes were intensely red, the tonsils ragged, with deep crypts filled with cheesy debris, and the posterior pharyngeal wall covered with thick mucopurulent secretion. The teeth were dirty, several carious, and adjacent to these the gums showed several small superficial ulcerations at the dental margin, while a thin gray film covered the lower gums at the back where the teeth were not yet erupted. The gums bled rather easily. The back of the tongue was thickly coated and there was a slight, peculiar odour to the breath that could not be identified and was not fetid. No submaxillary glands were palpable.

Much thick mucopurulent secretion came from the nose and there were two small herpes at the nares. There was considerable mucopurulent discharge from both eyes, the lids being stuck together with it, and both bulbar and tarsal conjunctivæ were injected and inflamed. Photophobia was extreme.

The chest was normal except for a few coarse râles on the left side, the abdomen and genitalia were normal, and the extremities showed no subperiosteal hemorrhages or joint lesions.

The reflexes were present and normal, the musculature of poor tone.

Temperature, pulse and respiration were also normal, and the admission specimen of urine (not by catheter) was of a high specific gravity (1026), with a trace of albumin, a few epithelial cells and leucocytes. Blood examination showed a slight secondary anemia, and a white cell count of 8,850 with 68 per cent. polymorphonuclears. The result of the von Pirquet test was negative and the blood Wassermann was negative to all antigens.

Cultures from the nose and throat gave a growth of staphylococcus and diptheroids. The blood culture also showed growth of a pigmented staphylococcus, undoubtedly a contamination.

The rhinological examination (Dr. Quittner) disclosed no involvement of the sinuses and the eye grounds were reported normal by Dr. Wolfenstein. Roentgenological examination of the chest showed slight peribronchial thickening throughout the chest, and a definitely widened bronchus in the left base.

The duration of the child's stay in the hospital was nineteen days. During the first few days the purulent discharge from the eyes and nose gradually lessened and then disappeared and the condition of the mouth and gums improved rapidly and ultimately became normal, the conjunctivæ and the oral and pharyngeal mucous membranes showing no evidence of inflammation. To our great disappointment, however, there was no corresponding improvement in the child's general condition. The cough continued, many course râles were heard over the left chest, and for a few days the temperature was slightly elevated, but never above 101°, and the leucocyte count rose to 18,750. Her peculiar behavior and evident distress remained unchanged and while occasionally for a day she would take food better and even ask for some article (which she would usually refuse when brought), in general her feeding was accomplished only by the persistent efforts of a skillful nurse. Midway in her stay, her abdomen became very distended, tympanitic, and tender, without other signs of gastrointestinal disturbance than a slight constipation and continued so for three days, with some relief from repeated turpentine enemas.

On the fourteenth day, the child seemed definitely better. Her chest was clear, cough slight, there was no abdominal distention, and the photophobia and edema of the lids, which had persisted after the conjunctivæ were no longer inflamed, were no longer evident. The eruption too had faded, leaving a dirty brownish stain, but the superficial ulcerations in the axillæ showed no tendency to heal and were in fact somewhat larger. The general hyperesthesia and tenderness on manipulation were unaltered.

Two days later the child became somewhat cyanotic, abdominal distention reappeared, and she had difficulty in swallowing fluids. Examination showed abolition of the pharyngeal reflex and paralysis (unilateral) of the palate. She refused all food and liquids and attempts to feed her by tube had to be abandoned on account of the alarming increase in cyanosis and symptoms of collapse that ensued. Dysphagia increased and was evident for both fluids and solids. Death occurred three days later.

The pathological report on a small piece of liver, the only tissue we were permitted to examine was: The section of liver shows marked fatty degeneration throughout. The cells all show cloudy swelling and most of them show large globules of fat within their substance. These fat globules vary in size from pin point ones to ones that completely fill the cell. The portal spaces show an increased number of bile ducts, also an increased amount of fibrous tissue. There is a marked congestion throughout and many red blood cells are seen in the interstitial tissues. This may be due to misplacement by cutting.

Diagnosis of Specimen: Fatty degeneration and infiltration of liver.

In the diagnosis of the illness a deficiency disease or arsenic poisoning seemed most probable, especially the latter, as the symptoms and signs did not conform to the clinical picture of any known deficiency disease though somewhat resembling pellagra.

With these possibilities in mind a careful investigation was made of the child's home, the family diet, etc.

While milk had been the chief article of her diet she had also had fruit, vegetables and chicken, and tastes of whatever the family had. The family diet was no different from that of other Jewish families of small means and decidedly more varied than that of many families of similar economic status but different nationality. All the other members were healthy and well nourished and the younger child (an infant of ten months) showed no evidence of rickets or scurvy.

The family occupied a comfortable four room second story apartment, well lighted with windows affording ample opportunity for ventilation. It was clean and comfortably furnished. The stairway and hall leading to it from the street were painted green, the general living and dining room had been papered with green paper two months previous to the onset of the child's illness. The bedroom in which the child's crib occupied a corner, also had green paper on the walls that was on there when the family moved in four months before the child's illness, and two weeks before the child became ill, the mother had dyed the lace curtain that hung in the doorway between bedroom and living room, and hanging against the foot of the child's crib, coloring them green.

Our provisional diagnosis was arsenic poisoning. Examination of the urine, for arsenic, was, however, negative. The family would permit the removal of only very small samples of the wall papers and analysis of these also failed to reveal arsenic. The mother had none of the dye used in coloring the curtain left, but purchased at the same drug store another packet exactly like the one used, she said. This proved to be of a long used, well-known brand, and neither the dye from this packet, nor the fair sized piece of the curtain, could be shown by analysis to contain arsenic.

From the clinical picture, with its combination of nervous, skin, respiratory, and ocular symptoms, the extreme anorexia, restlessness, hyperesthesia, and general wretchedness, it seems probable that this was a case of the so-called "acrodynia," and one that well illustrates the difficulties, at times, of distinguishing the syndrome from arsenical poisoning.

Treatment was entirely symptomatic, and aside from local measures for the relief of the conjunctivitis nasopharyngitis, and stomatitis, directed chiefly toward feeding and the supplyng of adequate amounts of fluid which were given parenterally when the fluid intake by mouth was insufficient. Orange-juice, prunes, apple sauce and vegetables were especially pushed.

The improvement of the ocular and respiratory symptoms, and the fading of the skin lesions, without corresponding improvements in the axillary ulcerations or the general condition of the patient, the occurrence of palatal and pharyngeal paralysis, and the fatal outcome, are especially interesting features of the case.

From the localization of the signs in the chest to the left side, their character, always coarse râles without definite impairment of resonance, and the roentgenological finding of a definitely widened bronchus in the left base, it seems probable that she had a bronchiectasis in that locality, a sequel of the bronchopneumonia that accompanied her attack of measles, or of the influenza, and that this bore the same relation to the condition as the sinus infection in certain of the reported cases, is of course possible.

No other case in any way resembling it has been observed either in the house or in the out-patient department of the hospital.

7016 *Euclid Avenue.*

SOME OF THE VAGARIES OF THE SYMPTOMATOLOGY OF PYELITIS

By D. J. Milton Miller, M.D.
Atlantic City, N. J.

It is universally recognized that great variations in the symptoms are such a constant feature of the pyelitis of infancy as to be almost as much a characteristic of the disease as the pyuria itself. The temperature, for instance, may exhibit wide fluctuations or may be absent throughout the whole course of the attack, while in the secondary forms the symptoms of the primary disease may mask entirely the local manifestations. In the primary cases again, the pallor, debility and fretfulness, constant symptoms of the disease, may be replaced by remarkably little general disturbance, although the pyuria be marked. The same peculiarities are seen in chronic pyelitis, which may present at one time the picture of profound wasting disease, and at another pyuria alone, with little or no general symptoms.

These facts, as has been already said, are so well-known, as to make their repetition appear to be quite superflous, were it not that medical men still occasionally fail to recognize this rather common affection, not so much from ignorance, as from failure to make careful examination of the urine in all acute and chronic affections of infancy, whether the diagnosis be self-evident or obscure and difficult.

With this thought in mind, it seemed to be not inappropriate to report a few cases from private practice, illustrating how varied the symptomatology of pyelitis may be.

Some degree of fever is one of the most constant of the symptoms of pyelitis, yet that the disease may run its whole course without this feature is shown by the case of M. K., female, age 5, seen November 5, 1919. Fretfulness, anorexia, vague abdominal pains and dysuria had been complained of for two weeks. General examination negative; but the urine contained pus, 100 cells per low-power field, and the colon bacillus on culture. There was no fever at any time during the four weeks illness, and the patient was up and about. Treatment consisted in large doses (120 grs. daily) of sodium bicarbonate and citrate of potassium.

Pyelitis simulating pneumonia is not uncommon. M. L., female, 12 months, seen March 20, 1912, had sudden vomiting and high fever from 105°-106°, with daily variations of scarcely a degree; slight cough, abdominal distention; respiration 60, pulse 150 (1 to 2½); leucocytes 28,000; examination of lungs negative; diagnosis of pneumonia was made, until, on the 6th day, the urine revealed pus, 30 cells to low-power field. This case demonstrated the sometimes striking, specific effect of alkalies; the temperature fell by crisis to normal after 66 grains of citrate of potassium had been given daily for two days. In the absence of the x-ray, other diagnosis than that of pneumonia would have been impossible in this patient, had not the urine been examined, or the subsequent course revealed the true nature of the attack. Here may be referred to the not infrequent association of pyelitis with respiratory affections. Two of the cases in my series were consequent upon bronchitis. One, a girl of 7 months, who developed fever, running up to 105°, during the course of a bronchitis, which was found to be due to a pyelitis and not to the respiratory affection; the other, a girl of 10 months, in whom a persistent mild temperature was discovered, on the 10th day of a tracheobronchitis, to be dependent upon pyuria, the fever yielding promptly when treatment appropriate to the latter condition was instituted.

A somewhat similar association was that of R. N., age 3 years, female, in whom a mild pyuria complicated a tonsillitis with marked adenitis. In this child the pus cells did not exceed 8 per low-power field, and the urine cleared up before the adenitis subsided.

Chills are not common in pyelitis, at least, not in my experience, or in that of most American writers, although John Thomson lays stress upon the occurrence, especially at the onset. In the following case, however, they were frequent and distressing: M. D., 5 months old, seen March 26, 1918; for 2 weeks crying spells, colic and indigestion; then suddenly the infant became deeply cyanosed, with intense coldness of feet, hands and skin, and temperature of 104 degrees. These attacks recurred almost daily for a week, were associated with marked collapse and were alarming; fever invariably attended them (104°-105°). They were treated with hot baths, mustard and stimulants. Undoubtedly they were chills, although no distinct rigor was apparent. The urine contained a large amount of pus, the leucocytes 25,000. This case ran a prolonged course of several months, possibly because initial high alkaline treatment was difficult, owing to digestive disturbance induced thereby.

Definite abdominal pain is another rare, and, when present, may be a misleading symptom of pyelitis. In young infants this symptoms is, of course, difficult to elicit, and although older children of from 2 to 2½ years sometimes give evidence of abdominal discomfort, especially when palpated, actual pain is seldom a prominent feature of the disease. Definite, localized pain was present in the case of G. M., male, 2½ years old, seen June 2, 1918, after 7 weeks of illness with fretfulness, wasting and increasing weakness. The child had complained constantly of pain in the left abdomen. Pressure to the left and just below the navel caused loud outcries; the abdomen was distended; leucocytes 28,000; R. B. C.'s, 2,000,000; hemoglobin 50 per cent.; temperature 100° to 102° or 103°. Grave abdominal disorder was feared, but examination of the acid urine discovered pus in large quantities, the pus filling ⅔ by volume of a 3 ounce bottle, the largest microscopic amount I have ever seen apart from surgical conditions. The child recovered completely. A more acute abdominal lesion was simulated in the case of P. S., July 11, 1919, 28 months old, brought because of 3 days' complaint of severe abdominal pain, the child placing its hand on the abdomen and bending over as in colic. Tenderness could be made out on palpation in the neighborhood of the appendix. The temperature was 102°. The urine contained pus—20 cells to low-power field. The pain rapidly disappeared under the administration of alkalies and salol in small doses.

Hematuria is more suggestive of nephritis or tuberculosis than pyelitis; certainly mascroscopic blood is not common in the latter disease. Yet it may occur and obscure the diagnosis for a time: D. K., 5 years old, female, seen April 2, 1918, had fever, backache and fretfulness for a week. The urine then became cloudy and very bloody, sufficiently so as to stain the night clothes a decided red. The urine contained pus (120 to the field) and large numbers of blood cells, and was acid; temperature 102° and fluctuating; colon bacillus on culture; no tubercle bacilli. Under 90 grains citrate of potassium daily, the urine became less and less bloody and the pus disappeared. Three years later the patient was perfectly well.

Occasionally an old pyelitis, apparently cured, is rekindled by some acute infection, confusing the diagnosis: I. R., age 3 years, female, had pyelitis at 12 months. Two years later she had otitis and mastoiditis. Toward the close of the latter, when the wound was healing and draining well, fever recurred, the temperature rising abruptly to 104°, then receding to normal. This was repeated several times. Sinus involvement and deficient drainage were duly considered and only partially excluded, when the discovery of pyuria made clear the febrile fluctuations. The amount of pus was small (8 cells to the field); but the cessation of the fever under alkalies—a sort of therapeutic test—established the diagnosis.

Pyelitis, at times, undoubtedly pursues an acute course, recovering completely without recognition and without treatment. Pus in amounts sufficient to constitute a pyelitis is sometimes found in the uncentrifuged urine of infants whose only symptom is fever, and in whom disappearance of the pus and cessation of the fever take place without treatment especially directed to the urinary condition. This sometimes happens at the close of the febrile attack, and makes clear an otherwise unexplained illness.

Routine examination of the urine of early life has led me to believe that acute, uncomplicated pyelitides, terminating spontaneously, are not uncommon. This is, of course, merely an opinion, with few positive data to substantiate it; but the following case would appear to give color to this presumption: P. N., male, 2½ years, had fever (102°-103°) without other symptoms, for a week. Two days after the fever had subsided, the urine, which had not been examined during the height of the attack, was found to contain a small amount of pus. There was no recurrence of the fever, and two weeks later the urine was normal.

Pyelitis is notoriously often resistent to treatment, yet it is possible that even prolonged attacks may recover of themselves, since the lesions of the disease are seldom seen at autopsy, and the affection is rare during the period of adolescence; although some of the cases seen in adult life are believed to have originated in infancy, just as the nephritis of adults, especially during pregnancy, may frequently be traced to attacks in childhood.

DEPARTMENT OF ABSTRACTS

Conducted by

Wm. Henry Donnelly, M.D., Brooklyn, N. Y.

Higgins, John M.: Spasmophilia (Pennsylvania Medical Journal, June, 1922, p. 616.)

The writer's desire is to invite greater interest among physicians in a study of spasmophilia. He quotes Dunn's definition "Spasmophilia is a condition peculiar to the early years of childhood, characterized by hyperirritability of the peripheral nerves to mechanical and electrical stimulation and by a tendency to tonic and clonic spasm." Clinically there are four general types; 1. laryngeal spasm; 2. eclamptic type; 3. carpopedal spasm; 4. latent type. The same case may present symptoms of more than one type and there are three well established clinical signs to consider in diagnosis. These are Erb's sign of increased electrical irritability, Chvostek's sign of contraction of the facial muscles on tapping below the zygomatic process, and Trousseau's sign of production of carpopedal spasm by constriction of the arm or leg. Preventive treatment includes maternal nursing, when possible, fresh air, sunlight, sufficient sleep, and a proper balanced diet. Curative treatment in the very young child would involve wet nursing, if mother's milk is not available. Cod-liver oil and the calcium salts, especially the bromide and the lactate, should be tried, but hygiene and feeding must be given precedence over drugs. W. H. D.

Thursfield, Hugh: Rickets (The Practitioner, July, 1922, p. 34).

Thursfield accepts the importance of a sufficient supply of fat-soluble A but recognizes, with Findlay, that confinement and absence of light, air, and cleanliness, are active factors in the production of rickets even if the supply of fat-soluble A is fairly good. He believes that the hypothesis that rickets is a pure "deficiency" disease is at least unproven, and reminds us that the bone changes of rickets are the secondary results of profound alterations in metabolism. These alterations are manifest to the trained observer before there is time for changes to occur in the long bones. In clinical medicine it is enough for us to find restlessness, undue sweating, polyuria, loss of muscle tone, backward dentition or defective ossification of the bones of the skull. If these signs are noted and the child treated by diet, fresh air, light, and exercise we may hope never to see the bony deformities of this disease. W. H. D.

SUNDELL, CHARLES: SLEEPLESSNESS IN INFANTS (The Practitioner, July, 1922, p. 89).

In only one type of disease of infancy is there spontaneous failure of the sleep habit-grave mental impairment as seen in Mongols or hydrocephalus. Commonest causes of sleeplessness are discomforts of the gastrointestinal system, then the habit of rocking the child, irregular habits and excitement while awake. Drugs should only be resorted to when all other means fail, and then an adequate dose should be given the first evening, with a view to using the descending scale of dosage. Ammonium bromide and chloral are the best drugs, as synthetic sedatives are unsuited for babies, and opium is dangerous. W. H. D.

KELLY, E. H.: PURPURA FULMINANS FOLLOWING MEASLES (British Journal of Children's Diseases, April-June, 1922, p. 86).

Only a few cases of purpura hemorrhagica and purpura fulminans have been reported following measles. The patient was a boy aged 17 months, who developed true purpura fulminans on the 17th day of his stay in the hospital and who died 17 hours after the onset of the purpura. W. H. D.

POYNTON, F. JOHN, THURSFIELD, HUGH, AND PATERSON, DONALD: SEVERE BLOOD DISEASES OF CHILDHOOD (British Journal of Children's Diseases, April-June, 1922, p. 57).

This is "part one" of a series of observations from the Hospital for Sick Children in Great Ormond Street, London, and the writers admit that, in spite of a great amount of work, these blood diseases are still obscure both as to origin and classification. The cases seen in two and a half years have been considered under the following headings: (A) congenital anemias—acholuric jaundice and polycythemia; (B) severe anemias—anemia gravis or aplastic anemia, von Jaksch's anemia; (C) leukemia; (D) simple anemia—chlorotic type; (E) lymphadenoma; (F) purpura. W. H. D.

KRAMER, B., CASFARIS, H., AND HOWLAND, J.: ULTRA-VIOLET RADIATION IN RICKETS (American Journal of Diseases of Children, July, 1922, p. 20).

Five children showing clinical evidences of rickets, confirmed by x-ray, were treated by the mercury vapor quartz lamp. This was followed in every case by healing of the rachitic process in the bones. The inorganic phosphorus concentration of the serum of these children was low (2.7 to 3.2 mg.) before treatment and increased to a maximum on 6 mg. with the appearance of calcium deposition in the bones. Apparently this healing took place at about the same time as it does after cod-liver oil, and the changes in the phosphorus concentration of the serum were identical with those seen after cod-liver oil treatment. The pigmented skin of a negro child did not interfere with the action of the light rays nor was more intensive treatment necessary than in the white children.

W. H. D.

MCLEAN, STAFFORD and JEIDELL, HELMINA: DATA IN 3742 PIRQUET TESTS (American Journal of Diseases of Children, July, 1922, p. 73).

Of the entire group tested, 2204 were males and 1538 females with approximately the same proportion of positive tests, namely, 15 plus per cent. Under one year of age there were 2000 tests with a positive percentage of 7.35 and over three years there was a positive percentage of 32.24. W. H. D.

ROSAMOND, EUGENE: INTRA-CRANIAL HEMORRHAGE IN THE NEW-BORN (Southern Medical Journal, August 1922, p. 618).

Rosamond states that over 50 per cent. of deaths in the new-born are caused by cerebral hemorrhage due to the hemorrhagic disease of infancy. Over one half of the new-born infants who now die could be saved by a routine determination of the coagulation time of the blood, and by the administration of whole blood or serum to those who show prolonged clotting time and delayed bleeding. The classical symptoms of cerebral hemorrhage, namely, bulging fontanel, spasticity, convulsions, respiratory and cardiac disturbances may occur late in the disease or not at all. The majority of cases develop insidiously. Of 17 cases of convulsions seen in the new-born in one year 14 had delayed bleeding-clotting time and in all probability were due to cerebral hemorrhage. The author reports a case of convulsions in a new-born infant where the bleeding time was 12 minutes and the clotting time 19 minutes. Five c. c. hemoplastin were given in the longitudinal sinus and the same quantity in the gluteal muscles with the result that seven hours later the clotting time was 9 minutes and the bleeding time 5½ minutes. The baby made a uneventful recovery and is at present in perfect health. The purpose of this report is to accentuate the diagnostic value of a simple test, and of a simple therapeutic procedure; to emphasize the frequency of the condition, and the importance of its early recognition by routine examination of the bleeding-clotting time in the new-born, or at least in every sick new-born child. W. H. D.

ZAHORSKY, JOHN: ACRODYNIA IN INFANTS (Journal of the Missouri State Medical Association, July, 1922, p. 296).

Zahorsky draws attention to several outstanding symptoms of acrodynia such as anorexia, whining, sleeplessness, swollen gums with often the falling out of healthy teeth, bluish-red swelling of the palms and dorsum of the hands. He states that if one sees a child who feels very miserable and who has red swollen hands and fingers, acrodynia should at once be thought of. Pronounced and diagnostic changes are found in the nervous system; at the onset hyperesthesia, later muscular weakness which may go on to complete paralysis of the lower extremities. The myotonia is striking, yet the baby objects to being handled. Striking too, is the high leucocyte count; from 12,000 to 40,000 is the usual range and the average of 20,000 to 30,000 is found with astonishing regularity. A summary of the clinical features would then be: a dermatitis, polyneuritis, inanition with a pronounced leucocytosis. Recovery usually occurs even in the severest types, and the treatment is symptomatic with the forced feeding of a diet rich in vitamines. Three new cases are reported in connection with two previously reported. W. H. D.

DEBRE, ROBERT and LAPLANE, LOUIS: THE OFFSPRING OF TUBERCULOUS PARENTS (Le Nourrisson, July, 1922, p. 249).

In a rather lengthy article, supported by statistics, the writers arrive at the following conclusions: 1. Pulmonary tuberculosis is an undeniable cause of premature labor, but is not a frequent cause of birth before term. 2. The weight of children born of tuberculous parents is approximately the same as that of children born of healthy parents. 3. When the tuberculosis begins during pregnancy the weight of the child is usually about normal. 4. When the tuberculous process antedates pregnancy there is seen 43 per cent. of births before term and a lessening of the weight of infants born at term. 5. When the child is the issue of a mother and father, both of whom are tuberculous, the weight is below normal. 6. When the child of tuberculous parents is born normal and healthy it is not more predisposed to congenital malformations or serious diseased conditions than the offspring of non-tuberculous parents. W. H. D.

CANNATA, S.: ADDISON'S DISEASE IN EARLY INFANCY (La Pediatria, July 1, 1922, p. 585).

Cannata reviews the literature and points out the rarity of Addison's disease in childhood, and then reports a case in a male child of 16 months. There was bronzing of the skin of the eyelids, the neck, the axillae, the mammary regions, the inguinal regions and the dorsal surface of the hands and feet. There were also localized areas of pigmentation on the posterior part of the thorax, the abdomen, the buttocks and the thighs. There was also brown pigmentation of the mucous membrane of the lips, the tongue, the palate and the gums. There was made out a bronchitis and tracheobronchial adenopathy; asthenia was pronounced, and the Pirquet was strongly positive. Suprarenal treatment as well as pluriglandular therapy was unsuccessful.

W. H. D.

MEDI, A.: HABITUAL VOMITING IN THE NURSLING (La Pediatria, July 1, 1922, p. 591).

Attention is drawn to a recent article in Le Nourrisson by Marfan which lays stress on the etiological importance of congenital lues in this condition. Medi, on the other hand, reports seven cases where hyperacidity was evidently the cause and where alkaline therapy was successful in treatment. W. H. D.

RIBADEAU-DUMAS, M.: DRY MILK AS A FOOD IN INFANCY (Bulletin de la Société de Pediatrie de Paris, May, 1922, p. 157).

The author reports for a committee of seven pediatricians regarding dry milk feeding in infancy. The conclusions are that dry milk presents unquestionable advantages from an economic standpoint; that it cannot replace maternal milk nor pure fresh milk; that it is primarily of help in digestive disturbances in infancy. It is indicated in vomiting not due to organic disease of the stomach, in indigestion of cow's milk, in diarrheas, especially of the fetid type, in athrepsia, and is successful in many cases where there is anaphylaxis to cow's milk (here minute doses may be begun with a gradual increase). W. H. D.

LESNÉ, M.: INTRAVENOUS INJECTION OF SALICYLATE OF SODA IN THE INFANT. (Bulletin de la Société de Pediatrie de Paris, May, 1922, p. 201.)

While the infant and child tolerate salicylates without tinnitus aurium or delirium, and while the rectal route is quite efficacious, still the intravenous method avoids both gastric and rectal irritation or intolerance, and allows of a more direct action, more rapid results and more massive dose. It was first employed by Hendel in 1904, and it may be combined with either the oral or rectal method or both. Lesné always utilizes a freshly prepared 50 per cent. solution in distilled water, and the dose is 0.25 grammes per year of age. He has found the method painless, rapid, and harmless. W. H. D.

CUNNINGHAM, ALLAN R.: TREATMENT OF ASTHMA AND ASSOCIATED DISEASES IN CHILDREN. (Boston Medical and Surgical Journal, June 29, 1922, p. 876.)

Cunningham, in effect, divides his cases into three groups: first, those due to allergy; second, those due to bacterial sensitization; third, those due to miscellaneous causes which require very careful study. Allergic cases may simply avoid the offending protein, or they may be artificially immunized. This immunization may be accomplished either by subcutaneous injections at intervals of five days, or by increasing doses by mouth. The latter is the method of choice in young children. Patients not improved by avoiding offending proteins were given autogenous vaccine from their sputum at intervals of five days. The dose began with 40 millions and ended with at least 400 millions. Of 20 cases so treated there was a cure or marked improvement in 7, or 35 per cent. Bacterial cases, if still unimproved by vaccine treatment, may be helped or cured by a change of climate. Miscellaneous causes in this series were hypothyroidism, myocardial weakness due to puberty, diseased tonsils, and disease of the maxillary antrum. W. H. D.

GREENTHAL, ROY M.: SOME PHASES OF CARDIAC DISEASE IN CHILDHOOD. (American Medicine, May, 1922, p. 265.)

Greenthal divides the question of prognosis into that of life during childhood and of life and efficiency in later years. Dunn has reported 235 cases of cardiac disease in children due to rheumatism which he followed for a period of 10 years. The final outcome was that 88 lived and 147 died. Of these 147 deaths, 140 occurred before the age of 14 years. Treatment of chronic cardiac disease varies with the stages in which the disease is encountered. After acute endocarditis, the patient should remain in bed from 2 to 4 months to establish as good a compensation as possible. The patient is prepared for active life by massage, passive movements and graduated muscular exercise. The one principle in these treatments is to gradually increase but always to stay below the point of over-exertion. At the end of 3 months, the child is allowed out of bed and gradually begins to walk, first on a level, and then up and down stairs. Nux vomica is given to stimulate the appetite; iron by mouth or subcutaneously for anemia, and cod-liver oil for growth stimulating purposes. During complete compensation we must guard the heart against reinfections, and the best method is to remove infectious foci. The cardiac child should have a normal temperature at least 4 days before a tonsillectomy, and a white cell count below 10,000. Walking, riding, skating and regulated gymnastics are the best forms of exercises during this stage. The stage of decompensation requires rest in bed, morphine the first few days, chloral or bromides to produce sleep at night, and careful feeding. Digitalis does not give the brilliant results seen in adults. Dropsy calls for Epsom salts and diuretin. W. H. D.

ARCHIVES OF PEDIATRICS

OCTOBER, 1922

HAROLD RUCKMAN MIXSELL, A.B., M.D., Editor

COLLABORATORS:

Rowland G. Freeman, M.D...New York
W. P. Northrup, M.D........New York
Henry D. Chapin, M.D......New York
Francis Huber, M.D..........New York
Henry Koplik, M.D.........New York
Walter Lester Carr, M.D....New York
C. G. Kerley, M.D...........New York
L. E. La Fétra, M.D.........New York
Royal Storrs Haynes, M.D...New York
Herbert B. Wilcox, M.D.....New York
Charles Herrman, M.D......New York
Wm. Henry Donnelly, M.D...Brooklyn
Frank H. Richardson, M.D....Brooklyn
Edwin E. Graham, M.D.....Philadelphia
J. P. Crozer Griffith, M.D..Philadelphia
J. C. Gittings, M.D.........Philadelphia
A. Graeme Mitchell, M.D..Philadelphia
Charles A. Fife, M.D.......Philadelphia
H. C. Carpenter, M.D.......Philadelphia
I. A. Abt, M.D.................Chicago
William P. Lucas, M.D...San Francisco
R. Langley Porter, M.D...San Francisco
E. C. Fleischner, M.D.....San Francisco
Oscar M. Schloss, M.D..........Boston
Maynard Ladd, M.D.............Boston
Charles Hunter Dunn, M.D.....Boston
Henry I. Bowditch, M.D.........Boston
Richard M. Smith, M.D.........Boston
L. R. De Buys, M.D.......New Orleans
Robert A. Strong, M.D.....New Orleans
John Foote, M.D............Washington
Joseph S. Wall, M.D.......Washington
B. K. Rachford, M.D.........Cincinnati
Henry J. Gerstenberger, M.D..Cleveland
Borden S. Veeder, M.D........St. Louis
Frederick W. Schlutz, M.D.Minneapolis
Julius P. Sedgwick, M.D...Minneapolis
William Weston, Jr., M.D..Columbia, S.C
A. D. Blackader, M.D.........Montreal
Edmund Cautley, M.D..........London
G. A. Sutherland, M.D........London
J. D. Rolleston, M.D...........London
J. W. Ballantyne, M.D.......Edinburgh
James Carmichael, M.D......Edinburgh
G. A. Wright, M.D.........Manchester

PUBLISHED MONTHLY BY E. B. TREAT & CO., 45 EAST 17TH STREET, NEW YORK.

ORIGINAL COMMUNICATIONS

ACROCEPHALY.*

By Frank W. Young, M.D.

Chicago

This condition is one probably far more frequently seen than the relative paucity in literature would lead one to believe. It is evidenced clinically by an unusual head deformity, exophthalmos and characteristic roëntgen ray findings. It is so commonly associated with syndactilic extremities that the term "acrocephalosyndactilism" was coined by Apert[1] in 1906, who believed that the deformity of the extremities was not coincidental. The absence of other congenital deformities, such as exstrophy of the bladder, spina bifida, polydactilism, with acrocephaly, leads Park and Powers[2] to agree with Apert's theory relative to this condition. Fletcher[3] in 1911 found reported some 80 or 90 cases, of which only 25 were associated with syndactilism, but all presented to a greater or less degree the tower head, exophthalmos, digital impressions in the skull, and often optic nerve atrophy changes. This condition was first recognized by Von Graefe[4] in 1866. Since that time very little careful analysis has been made until Park and Powers, in their masterly article, reviewed the literature. They believe that acrocephaly, existing alone, and acrocephaly, existing in combination with symmetrically distributed deformities of the extremities, are not distinct lesions but are different expressions of one and the same thing; and accordingly discard the title acrocephalo-syndactilism. The cases which are the subject of this report are pure acrocephalics, without deformities of the extremities.

---

*Read before the Chicago Pediatric Society, March 21, 1922.

The underlying pathology is generally acknowledged to be a synostosis of the cranial sutures, dependent upon the sutures affected for the resultant cranial deformity. If the coronal and lambdoid sutures are involved, we have the condition of *acrocephaly, Turmschaedel, Spitzkopf, Tete à la Thersite,* or Tower-head, while the involvement of the sagittal suture causes the head to grow in a line perpendicular to the line of suture, giving rise to scaphocephalus.

These cases, like the cretins and mongols, have a marked group resemblance. The forehead is high and broad. The highest point of the head described in the various case reports is variable, some being in the region of the anterior fontanel, others at the posterior fontanel, etc., and often do not justify the term of tower-head. The occiput is almost flat and parallel to the facial plane. The eyeballs protrude, oftentimes to complete dislocation, and are set far apart. The eye grounds usually show an optic neuritis, which is probably secondary to pressure from a narrow optic foramen. The nose is thick and broad and projects from the face. the hard palate is narrow and high. The upper lip is short, the lower lip flat. The mouth presents the appearance of an isosceles triangle with the lower lip as the base. Dentition is often premature and in some of the reported cases the incisors were present in rows. The chin may or may not be prognathic. The face is widest at the level of the bizygomatic arch and in many cases there is a prominence of bone in the region of the metopic suture which was thought by Maygrier[5] and Fournier[6] to be a meningocele. This angulation of the sutures is a fairly constant feature, often involving the coronal, frontal or lambdoid sutures.

In the 25 cases described by Park and Powers, all of which were acrocephalo-syndactilics, 11 occurred before the age of 18 months. Of this number, 6 were new-born infants and the remaining 5 were 2, 5, 6, 10 and 12 months respectively. In these cases many showed angulation of the metopic and coronal sutures, while the fontanels varied in size as did the highest point of the head and, in a few cases, the fontanels contained wormian bones.

When present, the deformities of the hands and feet are fairly constant, varying only in degree and show a fusion of fingers and thumbs of both bone and soft parts which may be complete or partial. Synostosis of the radius and ulna, and limitation of scapulo-humeral articulation have been noticed. The intelligence and development usually conform to normal standards.

The x-ray findings are fairly constant. The variations in the density of the calvarium give rise to the so-called "digital impressions," which vary in number and occur usually in the frontal, occipital, or parietal bones. These rarefaction areas are caused by increased intracranial pressure and are more numerous in the area most directly compressed. The cases usually show a basilar lordosis and a marked decrease in the anteroposterior diameter of the anterior fossa and the middle fossa is described as being more nearly parallel than normal to the frontal plane. The posterior fossa is small and funnel-shaped and the orbital cavity is markedly reduced, from the downward inclination of the roof of the orbit and the upward projection of the great wing of the sphenoid. The calvarium of the skull shows varying degrees of density, the less dense areas, digital impressions, being most marked in the occipital region. There is no evidence of inflammatory changes in the meninges. There is no report of an examination of the pituitary gland.

CASE REPORTS.

CASE 1. M. L., female, aged 6 months.

Family History. Father was 20 years of age and mother was 21 when child was born. The father is under treatment for pulmonary tuberculosis and is at present in a sanitarium. This condition was diagnosed prior to the baby's birth. There is one other child, 2½ years old, who weighs 35 pounds and is perfectly normal in development. There is no history of any similar deformity in the family, the father knowing both his parental grandparents and the mother, after careful inquiry, finding no record of deformity in her family.

Brief History. Labor began 16 hours before birth and was normal in severity. No forceps were used in delivery. The bag of waters ruptured 3 hours before birth. The child was normal in appearance with the exception of its head, which was tower-like, and the eyes, which were exophthalmic. The child nursed at the breast for 5 months. Birth weight was 7 pounds, 3 ounces. Present weight, at the age of 6 months, is 13 pounds, 8 ounces. Child sat up at usual time, holds its head strongly but has no teeth. It has always had head colds but there is no history of any rash or excoriations around mouth or anus. There is no history of miscarriage and the father and mother both deny venereal disease.

Physical Examination. Examination shows a well-nourished girl infant, who sits alone and seems bright and observant, weight 13 pounds, 8 ounces. Circumference of the chest is 30.5 cm. and that of the cranium, 38.5 cm. There is a slight tendency to pes planus on both sides but there is no syndactilism of either hands or feet. The face is short and wide, the widest point being at the bizygomatic plane. (Fig. 1.) The forehead is abnormally high, and there is a prominence of bone corresponding to the metopic suture. There is a slight transverse grooving above the superciliary ridges. The hairline is high and the hair is abundant and reddish in hue. The occiput is flat, presenting none of the normal proturberances. The angulation caused by the metopic suture mentioned above is distinctly hard, beginning at the hairline and ending abruptly above the glabella and is 2 cm. wide. The skin is cyanotic above this protuberance and this blueness increases when the child cries. At the top of the head is a soft area, which measures 4½ cm. in width and 6½ cm. in length and probably represents the posterior fontanel. The anterior fontanel is apparently closed. There is no wormian bone present. The posterior and lateral angles of this large soft area branch downwards at the beginning of the lambdoid suture, which is, however, closed in its further length. There is slight angulation of the coronal sutures, which are also closed. The anterior and posterior lateral fontanels are closed. The ears flare slightly outward and are slightly rotated posteriorly. Examination of the drum membrane shows no abnormality. The eyes are set apart with the interocular breadth of 2 cm. The external canthus is slightly lower than the internal canthus. There is a definite degree of exophthalmos. Examination of the eye grounds, made shortly after entrance into hospital, showed the optic disks normal with vision apparently unimpaired, the media clear and reaction to light and accommodation normal. The mouth shows the upper lip short and retracted at the middle with the lower lip flat. The hard palate is arched measuring 2 cm. from the level of the alveolar margin. The root of the nose is flattened but its extremity projects. The nares are small and the nasal septum, while normal in front, is thickened posteriorly, causing partial obstruction, to which may be ascribed the constant "head colds." The hands are entirely negative, as are the forearms and rest of the body with the exception of the feet, which show a slight degree of pes planus.

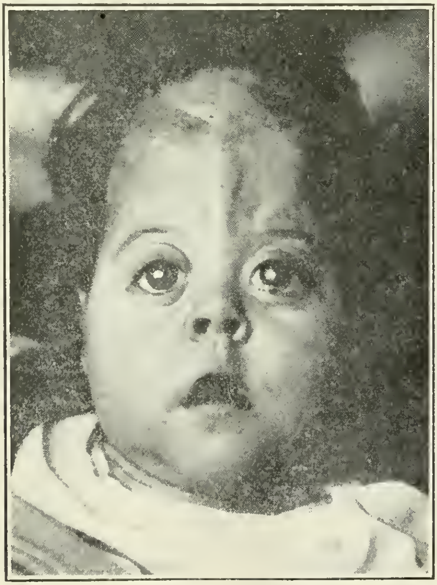


Fig. 1. Photograph of M. L.

Blood Wassermann and spinal fluid Wassermann are entirely negative. The spinal fluid showed no pathology. Blood examination showed 10,400 leukocytes; 4,640,000 erythrocytes; 86 per cent. hemoglobin (Sahli). Differential white count, 27 small lymphocytes; 10 large lymphocytes; 3 indentate nuclears; 59 polymorphonuclear neutrophiles; and 1 polymorphonuclear eosinophil. Von Pirquet test is negative. Examination for blood calcium showed .025 per cent. CaO and .018 per cent. total calcium.

X-ray examination showed digital impressions moderately well marked in the frontal area. The frontal bone rises sheerly and the anterior surface of the anterior cerebral fossa is markedly elevated. This is due to the upward direction of the wings of the sphenoid. Anterior and posterior clinoid processes are well marked and the sella turcica is deformed, being more semicircular than normal. The occipital bone lies in a plane corresponding to that of the frontal plane and there is an obvious decrease in the length of the base of the skull. The middle fossa is shortened and the posterior fossa is funnel-like. There is a marked open area at the top of the head in the region of the posterior fontanel. The area of the anterior fontanel seems closed but the bone is thin at this point. The coronal and lambdoid sutures seem definitely closed. The anteroposterior view shows a skull markedly increased in height and at its apex is deficient in bone. There seems to be some thickening in the region of the metopic suture.

MEASUREMENTS OF CASE M. L. COMPARED WITH MEASUREMENTS OF 10 NORMAL INFANTS.

	M. L. m.m.	Average measurements of 10 normal infants age 6 mos. m.m.
Greatest breadth of head	121	115.5
Greatest length of head	123	146
Projective ear height (tragus vertex)	142.8	121
Nasion-inion (base length)	125.5	145.75
Bi-auricular breadth (tragus-tragus)	102	101.5
Horizontal circumference of head	385	410.27
Sagittal arc (nasion-inion)	243.8	249.15
Transverse arc (tragus-tragus)	306.3	289.5
Smallest width of forehead	85	82.5
Bizygomatic breadth	95	90.18
Interocular breadth	20	15.5

External biorbital breadth	82.18	78.24
Length of ear	40	35
Breadth of ear	23	20
Average circumference (horizontal cir. plus sag. arc plus nasion-inion plus transverse arc plus bi-auricular breadth divided by 3)	387.83	398.7
Cephalic index (breadth divided by the length x 100)	97.2	78.1
Chin vertex height	182	168
Total face height	128	132
Upper face height	72	69
Nasal height	28	27.5
Nasal breadth	19	19.3
Breadth of mouth	35	40.2
Acromio-radial	178	175
Radial styloid	132	128
Length of hand	60	62
Ant. superior spine to int. malleolus	275	264

These measures are similar to those taken by Park and Powers and the rationale of interpretation is that used by Dr. A. A. Schultz, Department of Embryology, Carnegie Institute of Washington. The anteroposterior diameter of the head is diminished, M. L., 123 vs. 146 normal children. The breadth is slightly increased, M. L., 121 vs. 115.5, n. c. There is a marked discrepancy between the cephalic index of M. L. and that of normal children due to the great reduction in the anteroposterior diameter rather than to an increase in width and height (M. L., 97.2 vs. 78.1 n. c.). 97.2 indicated a hyperbrachycephalia which Dr. Schultz says is never found in normal crania. The forehead is wide and modifies the interocular breadth, M. L. 20 vs. 15.5 n. c. The bizygomatic diameter is increased, M. L. 95 vs. 90.18 n. c. The projective ear height is greatly increased, M. L. 142.8 vs. 121 n. c. and the base of the skull is markedly shortened, M. L. 125.5 vs. 145.75. The cranial capacity is found by averaging the circumference in three dimensions, by the formula horizontal cir. plus sag. arc. plus nasion-inion length plus transverse arc plus bi-auricular breadth divided by 3—M. L. 387.3 vs. 398.7 n. c., indicating a reduction in the cranial capacity which is due to a diminution in length as the increase in breadth and height does not compensate for this reduction. The other measurements are relatively normal.

CASE II. J. I., male, aged 4½ years.

Family History. Father and mother living and well. They have 2 normal children, age 6 and 8 years. There is no history of any deformities in the family.

Brief History. Labor was normal. Bag of waters ruptured 5 hours before birth. The peculiar conformation of the head was noticed at birth but was attributed to molding. The eyes were slightly prominent and the lids droopy. Child cut its first teeth at 5 months, sat alone at 6 months, pulled itself up at 11 months, walked at 14 months, and talked at 18 months. Child had always seemed bright and exceedingly tractable. The father took the child to the doctor when it was 2 years old because of the protrusion of the eyes. Since that time he has been to several physicians for treatment of conjunctivitis, which has become more marked with the increasing prominence of the eyes. The child's appetite is good, bowels regular, he plays as a boy of 4 and dresses and feeds himself. Past illnesses: Measles and whooping-cough and a tendency to "head colds." His general health has been good.

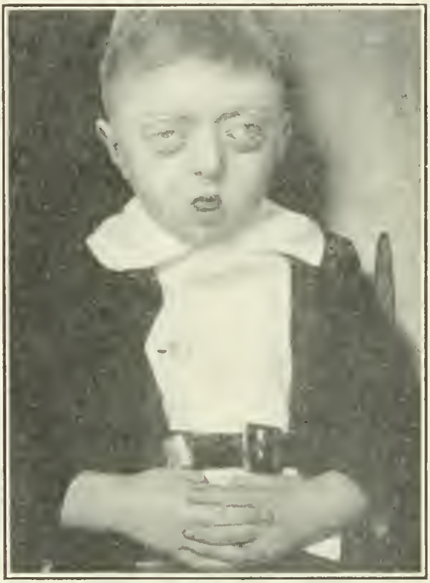


Fig. 2. Photograph of J. I.

Physical Examination. Examination shows fairly well developed boy, age 4½ years. (Fig. 2.) Weight is 39 pounds. The head is decreased somewhat in the anteroposterior diameter and rises to a point in the region of the vertex. The forehead is high and rather flat. The sutures and fontanels are closed and there is no angulation deformity at the site of sutures. The eyes are markedly prominent and the conjunctivae inflamed. The external canthi are slightly lower than the internal canthi. Eyes react to light and accommodation and eye grounds are entirely negative. Ears negative. The nose is rather prominent at its extremity and the nares small; there is some obstruction to breathing. The face is broad at the bizygomatic diameter. The mouth is normal in size, upper lip slightly retracted upwards in the middle, the lower lip flat, palate is arched. Child has a full set of teeth, in good condition; there is some crowding of the lower incisors. The tonsils are normal. Throat is slightly reddened. Chest is normally developed, expansion one inch; lung excursion normal, no adventitious sounds heard. Heart is normal in size, there are 2 tones heard at the apex, second pulmonic is increased, there are no murmurs heard. Abdomen is negative. Extremities are normal. Reflexes present and normal. Genitalia normal.

Blood Wassermann and spinal fluid Wassermann negative. Blood examination: 8,600 leukocytes; 4,820,000 erythrocytes; 87 hemoglobin (Sahli). There is no reaction to the von Pirquet test. Urine examination negative. Examination for blood calcium showed .013 per cent. CaO and .03 per cent. total calcium.

X-ray examination showed digital impressions in the entire calvarium, most marked in the frontal region. The sutures are closed and there seems to be some thickening in the region of the metopic suture. The wings of the sphenoid are raised and the frontal plane lowered, causing almost complete obliteration of the orbital fossae. The cerebral fossae are decreased in the anteroposterior diameter, the posterior fossa being markedly funnel-shaped. Sella turcica is outlined and is increased in depth. The sphenoidal angle is 148 degrees. (This is obtained by a line drawn from the nasion to the anterior clinoid process to the basion and normally is 134 degrees). When this angle is increased there is indication of a basilar lordosis.

MEASUREMENTS OF CASE J. I. COMPARED WITH MEASUREMENTS OF 20 NORMAL WHITE CHILDREN.

	J. I. m.m.	Average (Park and Powers) measurements of 20 normal white children age 4½ yrs. m.m.
Greatest breadth of head	138	137.95
Greatest length of head	153	174
Projective ear height (tragus vertex)	155	127.15
Nasion-inion (base length)	142	152.95
Bi-auricular breadth (tragus-tragus)	113.8	113.9
Horizontal circumference of head	485	509.8
Sagittal arc (nasion-inion)	295	344.75
Transverse arc (tragus-tragus)	348	341.3
Smallest width of forehead	112	90.8
Bizygomatic breadth	130	112.05
Interocular breadth	28.5	27.75
External biorbital breadth	93	83.45
Length of ear	60	52.70
Breadth of ear	35	29.95
Average circumference (horizontal cir. plus sag. arc plus nasion-inion plus transverse arc plus bi-auricular breadth divided by 3)	461.26	487.58
Cephalic index (breadth divided by the length x 100)	89	79.18

The measurements of J. I. compared to those taken from 20 normal children (Park and Powers) show, as does case M. L., that the decrease in base length—153 J. I. and 174 n.m.—is not compensated by the increase in height and breadth. This is evidenced by the decrease in the cranial capacity, which is 461.26 J. I. and 487.58 n.m. The cephalic index—89.04 J. I. and 79.18 n.m. —gives evidence of brachycephaly. The breadth is relatively normal but the projective ear height—155 J. I. and 127.15 n.m.—is markedly increased.

DISCUSSION.

Etiology. The various conjectures as to etiology have been carefully analyzed by Park and Powers. Syphilis has always been latent in the minds of the observers because of the persistent snuffles and crenated bone commonly observed. There is, however, no report of any case showing a positive Wassermann or other luetic manifestations. Babes[8] believed that malformations of the extremities, so commonly associated with acrocephaly, were due to pathology existent in areas in the base of the skull, which he thought were generic in function for the hands and feet.

Virchow[9], in 1851, classifying skull deformities believed that synostosis of the sutures was caused by inflammatory processes in the brain covering, which extending to the bones of the skull, inhibited their marginal growth and hastened closure. There is, however, in no case a definite history of meningitis, and no postmortem findings corroborating Virchow's theory. Thoma[10] believed that the premature closure of the sutures was caused by increased intracranial hypertension, secondary to oligohydramnios or other external uterine pressures, which resulted in an automatic deposition of lime salts. Rieping believed that the condition was due to variations in the germ plasm with a dislocation of the ossification centers or frontal and parietal bones towards the coronal and lambdoid sutures, causing a premature bony union.

Park and Powers believed that the condition is probably secondary to some circulating toxin, but why the condition should involve such widely differentiated parts as the head and extremities, which is so often the case, they cannot conjecture. Their views are based upon the fact that embryological differentiation of the mesoblast into hands and feet occurs at the fifth or sixth week and the bones at the base of the skull at the fourth week.*

Boidi Trotti[11], Gadelius[12] and others believe the conditions to be due to a disturbed function of the endocrines. These various theories, differing widely in application, agree that the primary pathology is a premature ossification of the sutures.

Knowing the relation of the endocrines to osteogenetic growth and knowing that perversion of endocrine function is often associated with disturbed bone formation, evidenced clinically by acromegaly, osteomalacia, etc., it seems highly problematical that this condition is due to the glands of internal secretion. The few postmortem reports do not give a clear description of the state of endocrines.

One rather important observation is the marked increase in calcium retention in these cases, which is 18 mg. per 100 c.c. (M. L.) and 20 mg. per 100 c.c. (J. I.) Howland and Marriott[13] have shown that the calcium values in blood for infants are essentially those found in the adult, namely, 10.8 to 11.5 mg. per 100 c.c.

---

*The skull is a mass of embryonic connective tissue surrounding the cephalic end of the notocord or primitive axial skeleton which extends forward into the nasal region and around the sides and dorsal portion of the neural tube or brain. Cartilage appears on either side of the upper end of the notocord, forming the sphenoid, ethmoid, and basi-occipital bones. The rest of the skull is derived from membranous bone.—Kirmission[14]).

infant blood; 9.2 to 11.2 mg. per 100 c.c. adult blood. These figures are further corroborated by Lucas[15], Jones and Nye in whole blood corpuscles and plasma. It is evident that the calcium is increased by almost twice that which we would expect at this age. The relation of calcium metabolism to the parathyroids has been definitely proven and MacCallum and Voegtlin[16] showed that in parathyroidectomized dogs the injection of calcium would ameliorate the symptoms of tetany. The parathyroids control the calcium exchange of the body and a hyperparathyroidism may be associated with an increase in calcium, as a hypoparathyroidism may be associated with a calcium decrease. There is a definite relationship existent between the parathyroids and the hypophysis which Matthews[17] described as a mutual inhibition. Thus one might reason that a hyperparathyroidism or clinical evidences of such would be associated with a hypopituitarism. One of Engelbach's many observations, as a symptom of infantile hypopituitarism, is a premature eruption of the teeth. Many of these cases of acrocephaly show a premature eruption of teeth; oftentimes two rows of incisors being present, and prognathism has been observed in many instances.

These suggestive facts, coupled with a condition which is due to a disturbance of bone development, strongly suggest that there is at the basis a dysendocrinism, dating from the blastema stage.

BIBLIOGRAPHY

1. Apert, E.: De l'acrocephalosyndactylie, Bull. et mem. Soc. med. d. hop. de Par. 23:1310, 1906.
2. Park, E. A. and Powers, Grover F.: Amer. Jour. Dis. Children, 20:235, 1920.
3. Fletcher: Quart. Jour. Med., 1910-1911, 4, 385.
4. Von Graefe: Arch. f. Ophth., 1866, 12, Part 2, p. 114.
5. Maygrier: Presentation d'un enfant atteint de malformations du crane (porencephalie) et des extremites (syndactylie) par hieredosyphilis, Bull. Soc. d'obst. de Par. 28, 1898.
6. Fournier, E.: Stigmates dystrophiques de l'heredo-syphilis Paris, 1898, Reuff et Cie, p. 373 (Obs. 328, p. 244).
7. Rieping, A.: Zur Pathogenese des Turmschaedel, Deutsch. Ztschr. f. Chir., 148: 1, 1919.
8. Babes, V.: Berl. Klin. Wchnschr., 41:464, 1904. Compt. rend. Acad. d. sc. 139:175, 1904.
9. Virchow, R.: Verhandl. d. phs. med. Gesellsch. in Wurzb. 2:230, 1851; Gesammelte Abhandlungen zur wissenschaftlichen Medizen, Frankf. a. M., 1856; Medinger Sohn u. Comp., p. 1024.
10. Thoma, R.: Virchow's Arch. f. path. Anat. 188:248. 1907: 206:201, 1911; 210:1, 1912; 212:1, 1913; 219:80, 1915: 223:129, 1917; 224:78, 1917; 225, 97, 1918.
11. Bertolotti, M., and Boidi Trotti, G.: Riforma med. 31:679, 1915. Also Boidi Trotti, G.: Gior. d. r. Accad. di. med. di Torino 21:123, 1915.
12. Gadelius, B.: Nord. med. Ark. 15; Pt. 2, 1, 1915.
13. Howland and Marriott: Tr. Am. Ped. Soc. 28:202, 1916.
14. Kirmission: Surgery of Childhood. Oxford Pub. p. 24.
15. Lucas, W. P.: Amer. Jour. Dis. Children, December, 1921.
16. MacCallum and Voegtlin: Jour. Exp. Med. 2: 1909, 118.
17. Matthews: Textbook of Physiol. Chem. p. 694, 1921 ed.
18. Lewin: Am. Jour. Dis. Children, 13:67-72 Jan. 1917.

PARENTERAL INFECTION IN INFANTS; ITS RELATION TO DIGESTIVE AND METABOLIC DISTURBANCES. REPORT OF ILLUSTRATIVE CASES.*

By Harry Robert Litchfield, M.D., and Leon H. Dembo, M.D.

Washington, D. C.

The frequency of parenteral infections in the baby wards of the various hospitals throughout the country is of sufficient importance to receive careful discussion, not only from the standpoint that such a clinical condition exists as a significant etiologic factor in the digestive and metabolic disorders of infancy, but also from the fact that they are often terminal infections.

We propose to show in our discussion and charts the effect of parenteral infection on the temperature and weight curve of many of the cases in our baby ward during such an invasion.

Gerstley[1], in his discussion of this subject, states that the condition was first pointed out to him in Finkelstein's Clinic, and defines these infections as those which are present in some part of the body other than the intestinal tract, such as the ears, nose, throat, and bladder. He further states that these "little infections" are the etiological factors which constitute the majority of secondary diarrheas. From our own clinical observations, however, these infections, starting either as a nasopharyngitis or as a bronchitis ending in bronchopneumonia, became of such vast importance that we considered the diarrhea complicating the conditions as a minor factor.

The census of our baby ward before the outbreak of these infections was 16, nearly all having been admitted with the same complaint of "acute intestinal disturbance." A few had other complications, one a congenital heart lesion and another a severe pyelitis. In the latter case, a complicating bronchopneumonia led to a fatal termination. The remainder were showing progress up to the time of onset of the parenteral infections. The statistics of Smith[2] show that pyelitis constitutes about one per cent. of all cases coming to the attention of the pediatrician and is therefore an important consideration. It occurs at any age, the ratio of frequency in girls being about three to one. The disease frequently manifests itself with symptoms of the digestive tract: vomiting and diarrhea. It occurs not only as an independent condition, but also as a complication, appearing at the height of the disease or subsequent to it. Pyelitis, without complications, is almost never fatal, but in protracted cases intercurrent infections, especially pneumonia, are common.

---

*From the Medical Service of Children's Hospital, Washington, Dr. John A. Foote and Dr. C. B. Crawford, attending physicians.

[1] Hill and Gerstley: Clinical Lectures on Infant Feeding, p. 244.

[2] Smith, Richard M.: Pyelitis of Infancy, Medical Clinics of North America, Jan., 1918, p. 1165-1176.

Other considerations in parenteral infections are nasopharyngitis and acute purulent otitis media. The ease with which pathogenic bacteria can cause an extension from the nose into the eustachian tubes is now recognized. Griffith[3] states that not infrequently the inflammation attacks simultaneously or in sequence the nose, pharynx, larynx, trachea and bronchi. The danger of development of otitis is very great, especially in infancy and childhood. In infants the nutrition may be impaired by interference with nursing, and death may result from this cause (otitis) in those previously debilitated. The tendency for bronchopneumonia to follow nasopharyngitis is especially to be emphasized.

The following case reports and charts illustrate in detail the effects of parenteral infection. It is interesting to note that in every instance in which there was a loss in weight there was also an accompanying rise in temperature, suggesting a superimposed infection.

CASE 1. (Chart 1.) M. S., 11 months, female, admitted July 15, 1921. She was one of twins, mother dying in labor. Born at full term, birth weight 7¾ pounds. Measles at 8 months; no other illnesses. Feeding History: Was on condensed milk formulae since birth. Chief complaint on admission was failure to gain, extreme restlessness, taking her feedings poorly. Physical examination revealed a child poorly nourished, underdeveloped and anemic; skin was inelastic with marked loss of turgor. Liver and spleen were palpable. Weight on admission, 10 pounds, 12 ounces. Urinalysis showed numerous pus cells with one plus albumen, increasing in amount at subsequent examinations; amorphous phosphates were present and at times pus to infinity. Culture of a catheterized specimen showed faintly a typical reaction

---

[3] Griffith, J. P. Crozer: Diseases of Infants and Children, Vol. 2, pp. 4-5.

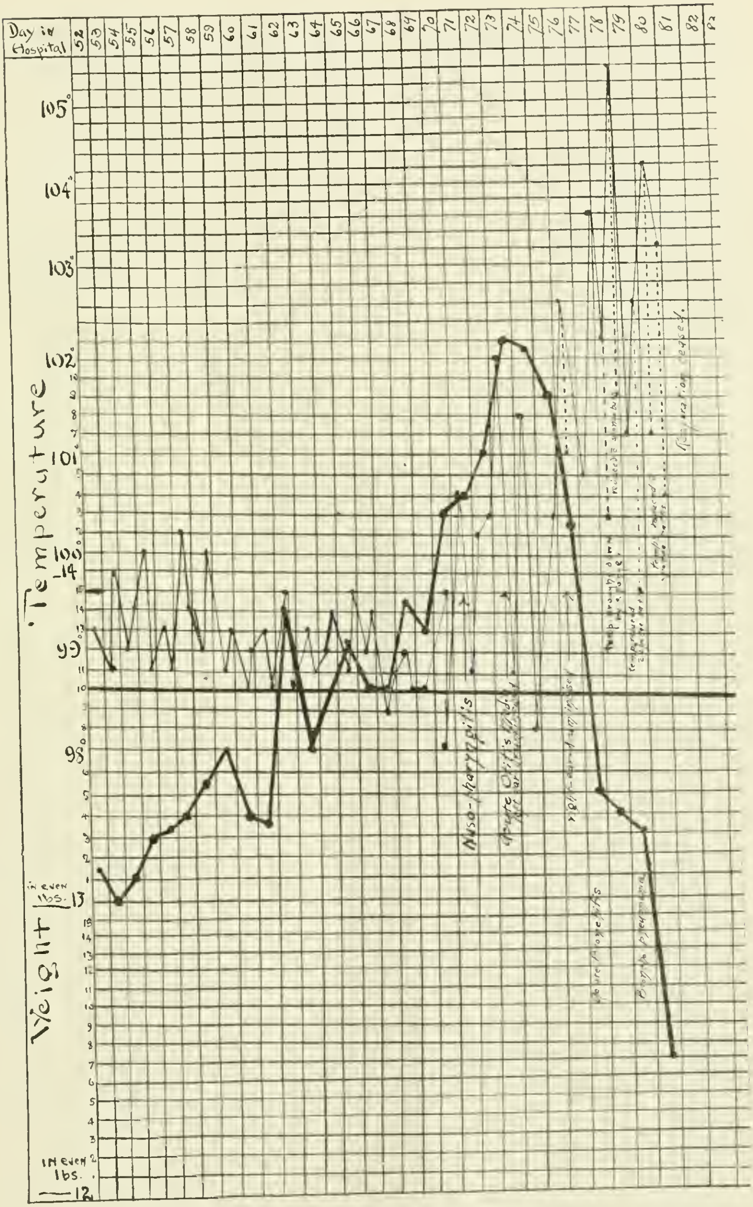


Chart 1. To accompany Case 1.

with saccharose; otherwise complete picture of colon bacillus. Blood examination revealed 60 per cent. hemoglobin, 2,890,000 R. B. C. and a leucocyte count of 10,000 with 43 per cent. polymorphonuclears. Later the hemoglobin rose to 75 per cent., with slight increase in the red blood corpuscles. The highest leucocyte count was 20,000. Wassermann and von Pirquet were negative. The little patient improved for a time, making fairly rapid gains in weight, under treatment. Occasionally there were exacerbations of fever, with pus and albumen in the urine. A month after admission, the weight had reached 11 pounds, 12 ounces. The highest weight reached was 14 pounds 4 ounces, at which time she contracted a rather severe nasopharyngitis. This was followed by a purulent otitis media, unilateral. This was promptly followed by a marked secondary diarrhea. Smear and culture from the affected ear showed pure staphylococci. As will be seen from the chart, the temperature rose at the onset of each infection, with a corresponding drop in the weight curve. A terminal bronchopneumonia proved fatal.

CASE 2. (Chart 2.) Baby M. H., admitted with a history of diarrhea, vomiting, loss of weight and restlessness, of 4 days' duration. Birth weight 7½ pounds. Breast fed for 3 months, following which she was placed on whole milk formula. Age on admission was 13 months. Physical examination showed an acutely ill, undernourished and markedly dehydrated child, with the usual signs of malnutrition. Urine was negative on admission. White cell count varied from 16,000 to 23,000. Differential showed a 15 per cent. eosinophilia. Stool typing for dysentery was negative. Smear from the affected ears revealed staphylococci and streptococci. Von Pirquet and Wassermann were negative. The general condition, prior to the development of the otitis, improved. Stools were normal and the weight was increasing. An acute, fermentative diarrhea suddenly developed with a coincident rise in temperature, leucocytosis and restlessness, and a rapid decline in weight. Examination disclosed a double otitis media. In this case, also, a bronchopneumonia terminated the picture.

CASE 3. J. L., female, age 5 months, admitted Aug. 30. Born at full term, forceps delivery. At time of birth, mother was told that the child had heart trouble. Birth weight 9

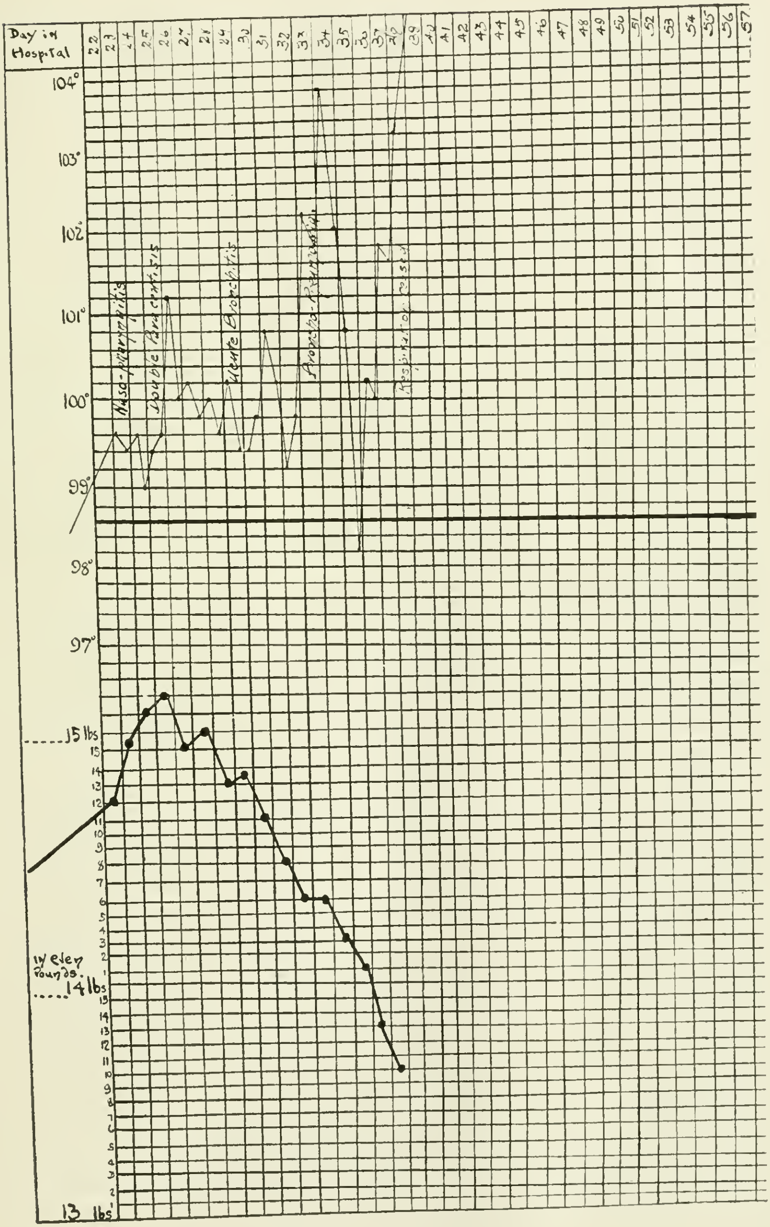


Chart 2. To accompany Case 2.

pounds. Condition was fair until one week before admission. Was on breast milk for 2 weeks after birth, following which was placed on a whole milk dilution. Chief complaint on admission was diarrhea, with numerous, loose, green stools containing large amounts of mucus, but no blood. Was very restless, took its feedings poorly, and lost weight. Physical examination showed a poorly nourished, underdeveloped, female child of 5 months, markedly cyanotic, the cyanosis increasing when she cried. Has a cleft palate. Heart reveals a marked thrill on palpation, with a double murmur on auscultation, transmitted over the entire precordium, the axilla and the back. Stool typing, negative. Urine shows plus albumen and acetone. Blood picture shows nothing remarkable other than an increase in the erythrocytes. The child was placed on a two-thirds protein milk mixture. The stools improved and became less frequent. The weight remained about the same. Within a week a whole milk mixture was substituted, followed by a gain in weight. About this time a nasopharyngitis developed, followed by an acute otitis, death ensuing from a terminal bronchopneumonia.

COMMENT. It will be readily seen that this child was handicapped by the presence of an organic disease, but the progressive, combined infections were responsible to a great degree in causing a rapid disorganization of the digestive and metabolic activities. The combination proved too overwhelming a force to combat.

CASE 4. (Chart 3.) E. D., 6 weeks old on admission, weight 8 pounds, 9 ounces. Chief complaint, loss of weight and diarrhea. Was a fairly well nourished child, and on admission seemed to be in fairly good condition. She was put on a casec mixture, 2 ounces every 3 hours, and there was a prompt gain in weight, the stools became less frequent, and there was a marked improvement in the general condition. Ten days later a whole milk formula was substituted, and the child gained rapidly. Two months later, following variations in the condition of the child, she developed a nasopharyngitis. There was a prompt drop in weight, the stools became frequent, loose and green, undigested, and there was a decline in the general condition. Numerous mixtures were tried with no effect. With a subsidence of the infection, however, there was a decided improvement. The weight began to rise, stools became normal, and at this time the child is in good condition, gaining rapidly.

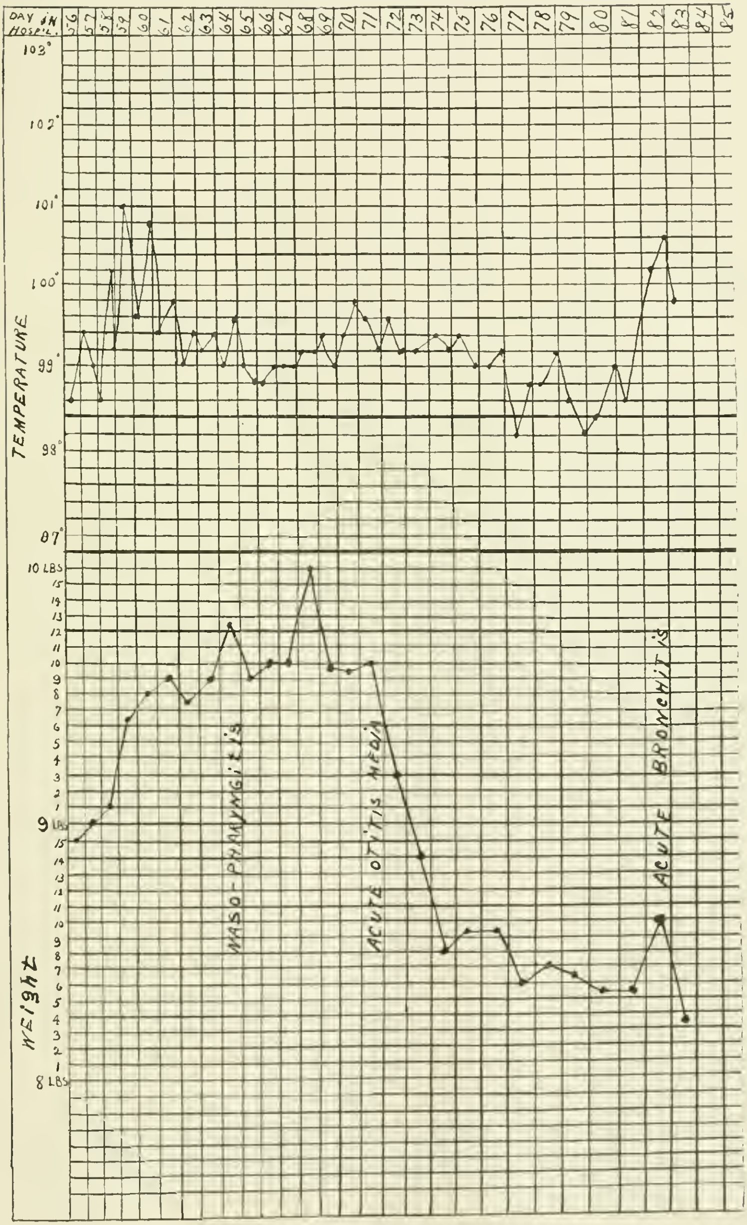


Chart 3. To accompany Case 4.

COMMENT. This case illustrates another point aside from the effect of parenteral infection—the question of the dangers of "hospitalization." This child, ordinarily, would have left the hospital before the onset of the pharyngitis, but conditions at home did not warrant the child's discharge at the time. Constant confinement served to decrease her resistance to the extent of increasing her susceptibility to infection. This emphasizes the point that, whenever possible, a child should be discharged at the time of steady improvement, thus obviating the dangers of rapidly spreading infections in a hospital ward, as in the case just cited.

CASE 5. (Chart 4.) W. T., male, white child of 7 months, admitted with restlessness, anorexia, marked weight loss and diarrhea. Stools were loose and greenish. Weight on admission was 8 pounds, 9 ounces. The child was on the verge of collapse at the time of admission. Several intraperitoneal injections of 5 per cent. glucose were given, and the child placed on breast milk. There was a slight improvement, stools becoming less frequent and of better consistency. Later a whole milk mixture was started and the child began to gain in weight. About a week later, when the general condition had improved considerably, with the weight steadily increasing and the stools normal, nasopharyngitis set in. At once there was a marked reaction. Stools became loose, greenish, contained mucus and large curds, the weight dropped steadily, and a complicating bronchopneumonia offered a rather poor ultimate prognosis. The condition, under active stimulation, improved. Six feedings, 4 of breast milk and 2 of protein milk, were given daily. The weight gradually increased, there was a gradual improvement in the gastrointestinal symptoms, and at present, on a whole milk formula, the child is doing well.

COMMENT. This case is interesting from the point of recovery, following a series of infections superimposed on an already debilitated constitution. It further illustrates how quickly a gradual readjustment of metabolism and digestion is disorganized by the onset of any of these infectious agents.

We have cited but 5 cases to illustrate the reaction caused by the various infections; all cases in our ward developed an acute nasopharyngitis and few escaped a subsequent otitis. All suffered a rapid weight loss, diarrhea and other gastrointestinal symptoms, many of a severe nature.

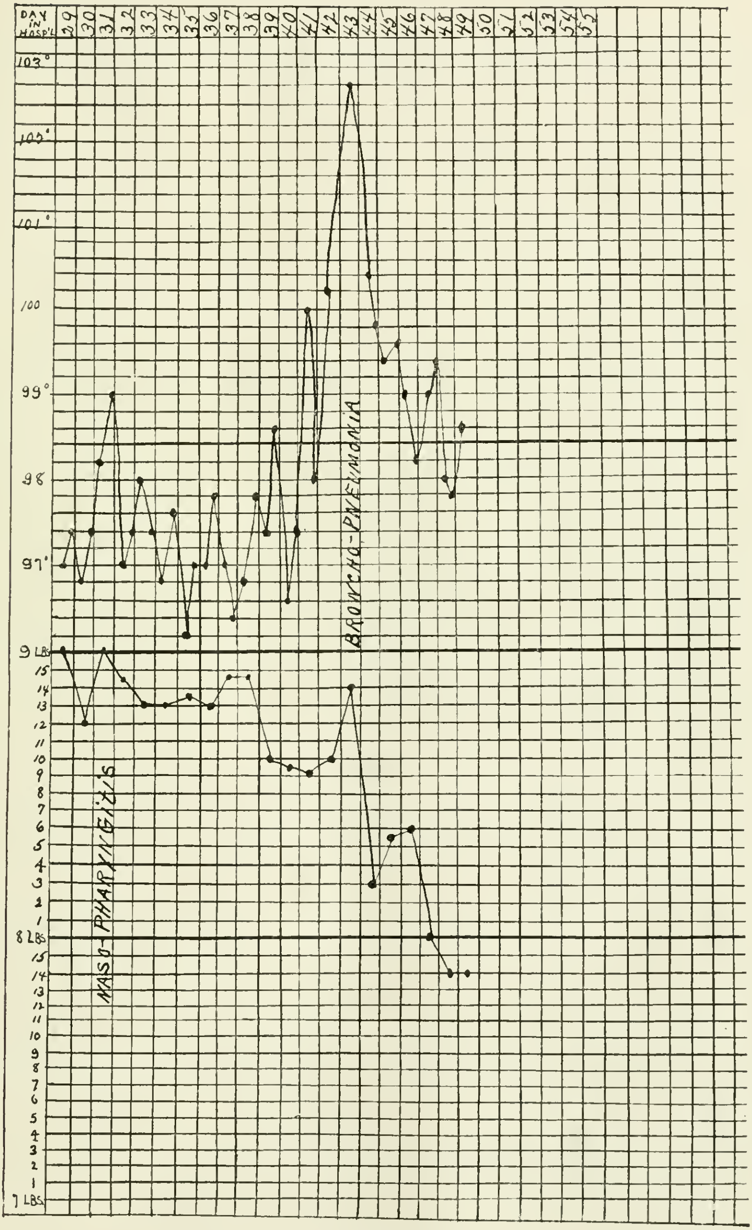


Chart 4. To accompany Case 5.

The question of how parenteral infection causes intestinal fermentation and consequent diarrhea is explained by Finkelstein's assistants. They have shown that during the progress of these infections the qualities of the digestive juices are changed. They are decreased in amount and in activity, and, as a result, two influences may be exerted: (1) Undigested food and sugar will proceed lower than usual down the intestinal tract. (2) Products of bacterial action in the nose and throat may impair the function of the intestinal cells and decrease their ability to keep the upper intestine sterile.

A word about the diet of these infants, suffering from parenteral infection, having a secondary diarrhea. We have found in these cases that the little patients do not tolerate a mixture high in calories. We have found it necessary to reduce both the quantity and quality (percentages of fat, etc.) and to maintain a relatively low caloric intake. Breast milk is of particular advantage in these cases because of its apparent detoxicating influence. Supplementary feeding of protein milk for the fermentative type of diarrhea has proved advantageous. In extreme cases, with dehydration and symptoms of collapse, intraperitoneal injections of 5 per cent. glucose, plus circulatory stimulation, will in many cases bring about a good reaction.

CONCLUSIONS.

1. Parenteral infections, occurring in infants previously debilitated, are dangerous elements, and often the final step toward a fatal termination.

2. They are especially dangerous in hospital wards, and the best means of combating them is rigid prophylaxis; careful supervision of the nurses in the baby wards, for frequently they carry infection, with strict isolation of every infant suffering from upper respiratory infection (rhinitis, pharyngitis, etc.) upon admission.

3. They are frequently the cause of severe gastrointestinal disorders in infants previously well, and should not be regarded as of minor consequence.

4. Treatment should be aimed at the infection as an exciting cause, and not only to the disturbances caused by it.

ACQUIRED SYPHILIS BY GENITAL CHANCRE IN MALE CHILDREN, WITH REPORT OF A CASE IN A BOY 5½ YEARS.*

By Mihran B. Parounagian, M.D., and

Herman Goodman, B.S., M.D.

New York

Acquired syphilis in childhood is more common than ordinarily supposed. Numerous reports are detailed in the literature, but in the main the point of contagion has been extragenital. The lips have been the most usual sites of syphilitic chancre in young children. The source of infection has been mediate or intermediate. Wet nurses have contributed their share; osculatory relatives and friends have deposited the spirochetes, and nipples and pacifiers have transferred the organisms. Genital sites for chancres in young children have also been reported. The majority of such children have, curiously enough, been females. The old fashioned and abandoned method of ritual circumscision contributed numbers of genital chancres in males, but the age of the children has of necessity been extremely early infancy. Other operative procedures have also been the cause of genital male chancre. Sexual contagion in male children has been rare. Recently, we had the opportunity of making a study of a child 5½ years old with a genital syphilitic chancre, extensive secondary cutaneous roseola, mucous patches, and a positive Wassermann. A search of the literature revealed few similar cases, and it was thought that a review of our case and others would be interesting and worthy of publication.

Case History. R. S., male, white 5½ years old, came to the dispensary with his father on April 4. The boy was of Hebrew parents, and had been circumscised. He was the fifth child. The other children were all healthy. There had been no miscarriages among his mother's pregnancies. Both the father and mother were well. The early history of the child had no bearing on the present complaint. The child was extremely quiet, made no voluntary statements, and did not, or could not answer questions regarding himself or his condition. We were able to learn from the parents that a lesion developed on the left side of the coronary sulcus about 2½ months before reporting at the hospital. Neither the parents, nor interested relatives and friends thought that this lesion could mean anything because of the youth of the patient. The sore seemed to reach its natural limits, and then receded. About that time, the child had a cough. He was taken to a dispensary, and some medicine prescribed. On March 23, an eruption of the trunk was noticed and the child was taken to a physician who made the tentative diagnosis of secondary syphilis, and advised a blood test. The parents were dissatisfied with this opinion, and took the child to another hospital where he was admitted, but on more deliberate examination of the attending physicians, was ordered discharged and recommended for admission to the venereal wards of Welfare Island. The parents did not wish to do this, but took the child to the Board of Health for a blood examination. On receiving the report the child was brought to the Syphilis Clinic of Bellevue Hospital. On admission, the boy presented a healed chancre of the coronary sulcus with definite scarring, and moderately enlarged inguinal glands. A fading, yet distinct macular eruption covered the trunk, from the hair line down posteriorly, and including the face anteriorly, with lesions on the extremities. The tongue presented a marked mucous patch. There was marked post-cervical, anterior cervical, and sub-occipital glandular enlargement. The epitrochlear glands were not palpable. The Wassermann report from the laboratory of the Board of Health was + + + +. The serological laboratory of the hospital also reported + + + + on a specimen of blood taken by us. The eruption faded and disappeared with antisyphilitic treatment. No other member of the household had had any eruption to the date of this writing.

---

*From the Department of Syphilology, Bellevue Hospital, New York City.

We were of course especially interested in the source of infection in this case. The closest we have been able to come concerns the following: The patient was of poor circumstances and lived in a large tenement house. On the floor below that of the apartment in which he lived was a woman who practiced a very ancient profession. It appears that the child, at such times as he left his own rooms, was in the habit of going in to see this tenant of the lower floor, who provided him with cookies and the like.

The mother of the patient persists in saying that she was unacquainted with the habits of this woman, and made no objections to the child going to her. We are unable to say definitely in what manner the boy acquired the infection yet only 2 possibilities occur to us. Either the affection was acquired from one of the patrons, probably through mal-practice, or there was sexual juxtaposition with the woman herself. Unfortunately, attempts at investigation were foiled by the woman disappearing when sought at her home. The child has been of no aid to us in determining the mode of transmission.

CASES FROM THE LITERATURE.

Hough reported a penile chancre and secondary syphilis in a child of 6 months. 1

Haines reported the case of a boy of 16 months with a chancre of the sulcus to the right of the mid-line. The lesion was positive for spirocheta pallida. There was slight inguinal adenopathy. The Wassermann was negative. The lesion cleared with 4 injections of neo-arsphenamin (0.15 gram). On the second visit, an urethral discharge containing gonococci was noted. The patient's colored nurse had a + + + + Wassermann, but examinations of the genitalia were reported to Haines as having disclosed no lesions. 2

Wolbarst reported the case of a little boy of 5, who had a typical genital chancre, with extensive secondary symptoms. 3

Lydston reported the case of syphilis in a boy of 6 years contracted by coitus or attempted coitus with a girl of 9 years. 4

Gottheil reported the case of a boy of 9 years with a chancre of the penis as the result of fellatio with a school mate. 5

Bolan reported a boy with a genital chancre at 8 years. A secondary eruption was also present. No data on the mode of infection was obtainable. 6

Reports of sexual infections beyond this age are more numerous, and the admission of sexual intercourse more readily obtained. Bolan had 2 other patients, for example, with genital chancres. One of these, 13 years of age with secondary syphilis and history of chancre after circumscision some weeks earlier, 4
admitted intercourse with a girl of 13. The other patient was 14 years of age, and had both a genital primary and a secondary

9 syphilis. LeCompte reported the case of a boy of 13 with a genital chancre acquired by intercourse. It was during the discussion of this case that Hough reported the infant mentioned above. In Hough's case, a nurse girl was the source of infection.

Syphilitic manifestations in the child are exact counterparts to those in adults. The chancre presents the same clinical character, induration, localization and adenopathy. It has been remarked however, and it was so in our case, that the primary adenopathy is slighter than in the adult. The secondary symptoms of acquired syphilis in childhood include the eruption, mucous membrane lesions, and ocular symptoms. A marked anemia may accompany the secondary manifestations. The later sequelae of syphilis acquired by children have been severe, and tertiary lesions have been common. The cause of this may have been, and most likely was, the fact that minimum treatment was administered, even if the infection was recognized. This recalls the possibility that the chancre of syphilis in young children may not be properly diagnosed, even if on or about the genitals.

~~The~~ Treatment of children about the age of our patient can be carried on with intravenous arsphenamin or neo-arsphenamin with good technic and a good operator. The dose is of course graded with the weight of the child, and the reactions. Mercury may likewise be given as in older persons by intramuscular injections. Every effort must be made to ferret out the source of contagion and any other case which may have arisen from the same source or from the patient.

SUMMARY.

We have reported a rare instance of genital contagion of syphilis in a boy of 5½ years. The sequence of syphilis was typical. There was a chancre of the sulcus, generalized eruption, mucous patches, positive Wassermann, and ready response to arsphenamin. The source of contagion was either a prostitute residing in the same building as the patient, or one of her patrons. We have reviewed the few cases of similar nature from the available literature, and mentioned some of the characteristics of acquired syphilis in childhood.

REFERENCES.

Hough: See LeCompte.
Haines: Acquired Genital Syphilis in the Infant, J. A. M. A., 70:370, 1918.
Wolbarst: On the Occurrence of Syphilis and Gonorrhea in Children by Direct Infection, Am. Med., 7, n. s.: 493, 1912.

Lydston: Case of Syphilis in a Boy, Six Years Old, Contracted by Coitus, N. Y. Med. J., 80:694, 1904.
Gottheil: Chancre of Penis in a Boy of Nine Years, Post-Grad., 23:200, 1908.
Bolan: Three Cases of Acquired Syphilis in Boys, Northumberland and Durham M. J., Newcastle upon Tyne, 22:87, 1914.
LeCompte: Case of Acquired Syphilis in a Boy of Thirteen Years, Wash. Med. Annals, 18:4, 1919.

In addition to the references given above, a large number of articles were consulted of which those given below are thought interesting:

Gottheil: Rare Syphilitic Infection (Chancre of Nail-Region in a Seventeen Month Old Infant), Southern Med. Record, 26:61, 1896.
Cocks: Youngest Case of Initial Lesion of Syphilis (Primary of Lip from Nipple and Secondaries in a Child of 9 months and 2 weeks) J. Cutan. Dis., 17:272, 1899.
Sluka: Ein 8 jähriger Knabe mit erworbner Lues (tonsil?) Mitt. d. Gesellsch. f. inn. Med. u. Kinderk. in Wien, 10:219, 1911.
Dore: Acquired Syphilis in a Girl of Ten (Chancre of Vulva), Proc. Roy. Soc. Med., London, 5^1:147, 1911-1912 Dermat.
Manne: Le Chancre Syphilitique chez l'Enfant, Thesis de Paris, 1909-10, No. 203.
Gaucher & Flurin: Sieges du Chancre Syphilitique chez les Enfants au Dessons de Quinize ans., Annales de mal Ven. 5:262, 1910.
Flurin and Manne: Des Modes de Contagion de la Syphilis chez les Enfants, Annales de mal Ven. 5:268, 1910.
Fournier: La Syphilitis Infantile Acquise, Revue Internat. de Med et Chir, 13:1, 1902.
Downie: An Account of Some Cases of Acquired Syphilis in Childhood (Four by Lip Chancre), Lancet, 1, 1126, 1894.

TREATMENT OF CONVULSIONS IN CHILDREN (Medizinische Klinik, Berlin, June 4, 1922. Blühdorn recalls that the convulsions of spasmophilia occur scarcely ever outside of the winter and spring, and that breast-fed infants escape as a rule. Infants overfed with milk, with a tendency to hard stools, are the predisposed; rachitis and spasmophilia have much in common. Overheating and prevention of radiation of heat are also liable to induce convulsions. An ample supply of fluids is imperative, poured into the stomach or rectum or infused subcutaneously. If chloral fails to relieve the spasmophilic convulsion, there is probably some organic cerebral process. Calcium treatment combats the spasmophilia effectually and the child can be fed as indicated. He prescribes it in the form of 10 parts calcium chlorid; 2 parts anisated solution of ammonia; 1 part gum acacia; saccharin to taste, and water to 200 parts. The dose is 10 c.c. six or eight times a day at first and then three times a day, kept up for a long time. Spasmophilia may accompany and aggravate organic disease, as in a recent case of convulsions in whooping cough. The electric and other tests were negative, and the convulsions seemed to herald the fatal termination. As a last resort, 20 c.c. of an 8 per cent. solution of magnesium sulphate was injected, and the benefit was amazing. In all organic cases, therefore, it is well to give tentative treatment for possible spasmophilia, to eliminate this factor, at least.—*Journal A. M. A.*

OBSERVATIONS ON THE EFFECT OF COMPLEMENTARY FEEDINGS OF DRY MILK POWDER ON THE INITIAL WEIGHT LOSS IN THE NEW-BORN.*

By James W. Bruce, M.D.

Louisville

Introduction. New-born babies usually loose weight for the first 2 or 3 days of life. This is spoken of as the initial weight loss and is regarded as physiological. The extent of loss is variously stated by different observers: 300 gms., Holt[1]; 240 gms., Ramsay and Alley[2]; 175 gms., in our own series of control cases.† The cause of this initial weight loss can be explained as:—1. Mechanical weight loss—due to passage of meconium and urine, vomiting of amniotic fluid, removal of vernix caseosa, etc. 2. Metabolic weight loss—due to excess of metabolic activity over nutriment derived from the mother's breasts. It is impossible to prevent mechanical weight loss, but it was the object of this work to prevent that due to metabolism.

The initial weight loss of new-born babies is a subject which has interested investigators for many years. As long ago as 1875, Ingerslev[3] attempted to prevent it by allowing new-born babies to nurse from mothers whose babies were several days old and in whom the milk secretion was fully established. He compared these with other babies who were allowed to nurse their own mothers in the usual way. He found that the babies who were wet-nursed lost more weight and took longer to regain their birth weights than the control babies. Kehrer[4] observed that dogs, cats, rabbits, and in fact most animals do not have an initial weight loss and explained this by the fact that they crawl to the udder and begin to suckle within a very short time after birth. Also the udders of animals contain a more abundant supply of milk when the young are born than those of human mothers. On the other hand, the baby is unable to nurse effectively, that is it is awkward at it, for 2 or 3 days, and so could not get much nourishment even if it were there to be obtained.

---

*From the Department of Pediatrics of the University of Louisville Medical School.

†175 gms. This figure is readily explained by the fact that only babies who regained their birth weight in 14 days are included.

Gundoben thinks the initial weight loss is due to the following factors: 1. Lack of ability of the baby to suckle for the first day or two and also to the small amount of breast milk present. 2. Loss of water through breathing and perspiration, and loss of heat incident to extrauterine existence. 3. Lack of development of the organs of digestion and assimilation. Gundoben believes that the initial weight loss can be lessened by wet nursing, but not entirely prevented. Rott[5] studied the refractive index of the blood serum of babies during their initial weight loss and of starving dogs, and found evidence to make him believe that the loss is due to starvation.

The most elaborate work on this subject is that of Schick[6]. He gave 12 new-born babies forced feedings of breast milk and prevented initial weight loss in 9 of them. For the first few days each infant received 10 per cent. of its body weight in breast milk i. e. that derived from its own mother plus complemental feeding. This was gradually raised to 15 per cent. of body weight. For the first 24 to 48 hours, they were fed every hour, then for a day or two every 2 hours, and by the fifth or sixth day every 3 hours. He states that no clinically demonstrable harm was done by the forced feeding, but that on the contrary the babies were unusually healthy looking, slept well and were quiet. The stools were of normal number and appearance, the only difference being that meconium disappeared more quickly than in ordinary cases. ~~He~~ believes ~~that~~ initial weight loss results from starvation, due to lack of milk in the mother's breasts and to inability of the new-born baby to get what is there. This latter fact makes wet nursing useless in preventing weight loss. He concludes that while ~~it~~ can be prevented, it is useless ~~to do so~~ except in very weak underweight babies. Ramsay and Alley[2] found that giving water (2 ounces after each feeding) had no effect on weight loss.

wt loss

Object, Methods, and Materials. The present study was undertaken with the object of determining the effect of complementary feedings of dry milk powder mixtures in preventing initial weight loss. Feedings were prepared as follows:

Dryco milk powder	7 level tablespoons.
Dextri-maltose No. 1	1 level teaspoon.
Water	210 c.c.

Total caloric value—125 calories.

30 c.c. after each breast feeding—7 feedings in 24 hours.

This mixture contains fat 1.5 per cent., carbohydrate 7 per cent., protein 4 per cent. Four to six hours after birth, babies were first put to their mothers' breasts and thereafter 7 times in 24 hours. After the infant had taken what it would, it was offered 30 c.c. of the above mixture in a nursing bottle. No effort was made to force the feeding. Babies usually took the complementary feedings very well for the first 3 or 4 days. After that, as the mother's milk secretion became more profuse, they did not take them so well. It was noticed that babies whose mothers had good supplies of breast milk took less of the complementary feedings than those whose

CONTROL CASES.

No.	Name	Birth Weight Grams.	Weight Loss Grams.	Duration of Loss-days	Time to Regain-days	% Weight Loss
1	K. S.	3150	270	4	8	8.5
2	B. F.	4270	270	2	6	6.3
3	L. B.	3740	150	2	4	4.0
4	C. R.	4030	390	2	7	9.6
5	E. S.	3390	30	1	2	0.8
6	M. W.	3420	150	2	4	4.3
7	J. M.	3920	120	2	5	3.0
8	H. D.	3420	180	2	4	5.2
9	J. R.	4240	300	3	8	7.0
10	E. S	2860	210	2	7	7.3
11	P. W.	3770	210	3	7	5.5
12	W. F.	3500	240	3	5	6.8
13	M. W.	4000	300	2	10	7.5
14	C. H.	4309	510	3	14	11.6
15	C. L.	3770	240	2	6	6.3
16	E. K.	3740	150	3	4	4.0
17	A. W.	3920	270	3	12	6.8
18	B. D.	2860	120	3	6	4.1
19	B. T.	3150	420	4	9	13.3
20	B. N.	3120	0	0	0	0.0
21	B. S.	3500	30	2	3	8.0
22	D. H.	3590	15	1	2	4.0
23	A. C.	3090	150	2	14	4.8
24	D. P.	4210	360	2	10	8.5
25	K. M.	2950	90	5	7	3.0
26	W. M.	3330	210	3	8	6.3
27	J. W.	4030	150	3	5	3.7
28	V. B.	4000	210	7	13	5.2
29	M. K.	3770	180	2	7	4.7
30	B. G.	3390	7	1	2	2.0
31	M. G.	3770	150	3	4	3.9
32	J. H.	3360	7	1	2	2.0
33	N. C.	4330	150	1	2	3.4
34	M. S.	3240	150	3	5	4.6
35	R. N.	3740	120	1	2	3.2
36	D. B.	3300	90	2	4	2.7
37	T. B.	3680	180	3	5	4.8
38	V. H.	3530	150	3	5	4.2
39	C. T.	3680	90	2	4	2.4
40	E. M.	2500	240	5	10	9.6
41	M. C.	3450	180	1	4	5.2
42	S. H.	3420	210	5	6	6.1
43	S. A.	3210	90	2	5	2.8
44	E. C.	3620	240	5	10	6.6
45	D. S.	3500	150	2	7	4.2
46	M. K.	3180	90	4	6	2.8
47	D. C.	3390	120	1	2	3.5
48	A. L.	3590	210	4	6	5.8
49	B. P.	3300	60	1	2	1.8
50	B. S.	2740	150	1	6	5.4
Average		3541	175	2.5	5.9	4.85

supplies were not so abundant. Babies were not weighed before and after nursing, nor was the amount of food left in the bottles determined. No clinically demonstrable harm was done the babies by these feedings. They were quiet and slept well. The stools were normal in number and appearance. They vomited no more than control babies, which were breast fed in the usual way.

The cases included in this study are 50 normal breast fed babies born in the maternity wards of the Louisville City Hospital. Since obstetrical patients are discharged from the hospital on the 14th day in normal cases, only those babies which had regained

included who

CASES GIVEN COMPLEMENTARY FEEDINGS OF DRY MILK POWDER MIXTURE.

No.	Name	Birth Weight Grams.	Weight Loss Grams.	Duration of Loss-days	Time to Regain-days	% Weight Loss
1	F. M.	3060	90	2	4	2.8
2	B. G.	3920	0	0	0	0.0
3	J. P.	3180	90	2	6	2.8
4	G. B.	3680	120	1	4	3.2
5	E. H.	4120	330	3	12	8.0
6	B. M.	3590	210	1	5	5.8
7	B. H.	3800	150	2	6	3.9
8	B. H.	2890	180	6	12	6.2
9	B. V.	3800	210	3	9	5.5
10	B. P.	4180	0	0	0	0.0
11	B. W.	3180	30	2	4	.9
12	B. R.	3330	120	2	8	3.6
13	B. H.	4800	180	3	10	3.7
14	R. B.	3740	120	2	5	3.2
15	B. C.	4300	120	2	5	2.7
16	B. C.	3090	270	4	11	8.7
17	B. S.	2420	210	3	6	8.6
18	B. J.	3240	60	1	3	1.8
19	B. M.	3500	90	3	4	2.5
20	V. Y.	3710	180	2	5	4.8
21	B. G.	2770	60	2	6	2.3
22	M. H.	3920	150	4	6	3.8
23	M. M.	4300	270	3	11	6.2
24	J. R.	3920	180	3	6	4.5
25	V. G.	3680	180	2	8	4.8
26	R. W.	4060	60	1	4	1.4
27	E. S.	3710	30	2	4	0.8
28	M. B.	3680	0	0	0	0.0
29	B. W.	4000	90	4	7	2.2
30	W. N.	4270	150	5	9	3.5
31	B. H.	3560	30	2	4	0.8
32	B. G.	3120	0	0	0	0.0
33	B. J.	3560	300	3	9	8.4
34	B. W.	3150	30	1	3	0.9
35	S. J.	3830	30	1	5	0.7
36	B. H.	3360	120	2	6	3.5
37	E. G.	2890	180	4	6	6.2
38	K. G.	3590	270	2	8	7.4
39	R. H.	3560	180	3	5	5.0
40	V. L.	3150	210	2	4	6.7
41	C. A.	3300	210	2	7	6.3
42	C. W.	2890	120	2	5	4.1
43	H. H.	3680	180	2	4	4.8
44	W. G.	3240	180	2	7	5.5
45	D. R.	3330	180	3	11	5.4
46	G. S.	2890	180	4	10	6.2
47	B. W.	3650	90	1	5	2.4
48	A. S.	2800	240	1	6	8.5
49	R. W.	8240	120	2	6	3.7
50	J. H.	3390	240	2	7	7.0
Average		3520.4	124	2.2	7.2	4.03

1st days

their birth weight in that time are included. Otherwise the cases are not picked or chosen in any way, but are taken in the order in which they were born. Before beginning observations on the complementary feeding cases, a series of 50 control cases was observed under identical conditions in the same wards. Control babies were allowed to nurse their mothers in the usual way, and no other nourishment was given them.

the latter

Discussion. The caloric value of the food which these babies received is somewhat a matter of conjecture. Ramsay and Alley[2] made observations on a series of 300 breast fed infants weighing them before and after nursing and gave the following figures for the daily quantities of breast milk obtained: first 24 hours, 39 c.c.; second 24 hours, 100 c.c.; third, 170 c.c.; fourth, 234 c.c.; fifth, 275 c.c.; sixth, 304 c.c.; seventh, 336 c.c. The caloric value of the complementary feedings given in this work was 125 calories. Therefore, assuming the correctness of the above figures, the caloric value of the daily feedings (breast milk plus complementary feedings) were as follows: first 24 hours, 151 calories; second 24 hours, 191 calories; third, 239 calories; fourth, 281 calories; fifth, 308 calories; sixth, 327 calories; seventh, 349 calories. Since the average birth weight was approximately 3.5 kilos and only varied from that figure, .17 kilo during the period of observation, we can say that the daily intake per kilo of body weight was: first 24 hours, 43 calories; second 24 hours, 54 calories; third, 68 calories; fourth, 80 calories; fifth, 88 calories; sixth, 93 calories; seventh, 99 calories. In other words, the complementary feedings increased the daily food value 36 calories per kilo of body weight.

The average weight loss of the complementary fed babies was 124 gms., while that of the control cases was 175 gms. The average percentage weight loss, i. e. the per cent. of birth weight that was lost, was 4.03 per cent. in the complementary fed cases and 4.85 per cent in the controls. The beneficial effect of complementary feedings was therefore not remarkable; however, what effect was noted was for good. The duration of weight loss was practically identical; 2.2 days in the complementary fed babies and 2.5 days in the controls. In the time to regain, the control cases did better (5.9 days) than the complementary fed babies (7.2 days.) I can think of no rational explanation of this fact.

Convincing conclusions cannot be drawn from a series of cases of this length (50 cases) and from the results of this work I would certainly not advocate routine use of complementary feedings. However, one observation is certainly justified. They did no harm. From this fact I feel that the use of complementary feedings can be strongly recommended for any new-born infant that is not progressing just as it should on the breast alone. They can be given with little or no danger of doing damage and are particularly valuable in the first few weeks, to give the baby a start when the mother's breasts for one reason or another may not be functioning properly.

SUMMARY AND CONCLUSIONS.

1. 50 normal breast fed new-born babies were given complementary feedings of dry milk powder mixtures and observations made as to initial weight loss, duration of loss, time to regain birth weight, and percentage weight loss.
2. Similar observations were made on 50 control babies, i. e. who did not receive complementary feedings.
3. Initial weight loss and percentage weight loss were slightly less in babies receiving complementary feedings.
4. Time to regain birth weight was slightly longer in babies receiving complementary feedings.
5. Results of this work do not justify the routine use of complementary feedings.
6. In view of the fact that complementary feedings were perfectly digested in all cases, it is urged that there be no hesitation in using them in new-born babies that do not gain weight satisfactorily on breast feeding alone.

BIBLIOGRAPHY.

1. Holt, L. E.: Diseases of Infancy and Childhood, 1919, p. 16.
2. Ramsay and Alley: Am. Jour. Dis. Child., 15:408, 1918.
3. Ingerslev: Uber Die Gewichtsverhaltnisse Der Neugeborenen, Nord. med. Ark. 12 (2), Nr. 7, 1875.
4. Kehrer: Uber Die Ursachen Der Gewichtsveranderungen Neugeborenen, Ark., Fur. Gynakal 1, 274, 1870.
5. Rott, Fritz: Beitrag Zur Wesenerklarung Der Physiologischen Korpergewichtsabnahme Des Neugeborenen: Zeitschr., Fur Kingerheilt 1, S. 43, 1911.
   . . . Zur Ernahrungstechunk Fruhgeborener Sanglinge-Zeitschr., Fur Kinderheilt 5, S. 134, 1913.
6. Schick, B.: Ztschr. fur Kinderh., Dec., 1915.

PERSISTENT CONGENITAL HYPERTROPHY OF THE RIGHT LOWER EXTREMITY.

By Sam R. Lustberg, M.D.

New York

Under the realm of abnormalities we often encounter very interesting conditions. Birth is the real opportune time to witness normabilities and abnormabilities (excesses and deficiencies) in the make-up of our future generation. Having noted one interesting case falling under the category of the excess group, I wish to report it.

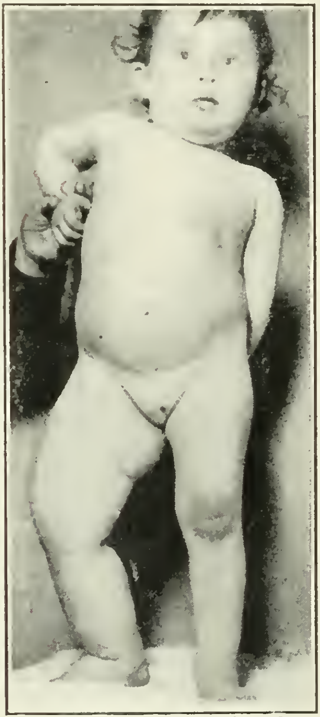


Fig. 1. Case of Congenital Hypertrophy of the Right Lower Extremity

Present History. R. N., female, age 2½ years, complaining of the right leg being larger than the left since birth, and relatively larger at birth than at the present time. No difficulty in walking, but tires easily. No mental symptoms. The skin over right leg and thigh has always been reddened.

Past History. Normal birth and delivery, weight at birth, 8 pounds, breast fed until 10 months, teething commenced at 6 months, crawling at 8 months and walking at 17 months.

Family History. Parents living and well. Two other children normal. No one in past generation similarly affected.

Examination. Healthy appearing child, weight 30 pounds. Walks very well, but tires easily. One cm. above the knee, the circumference of right leg is 20¾ cm.; left, 19½ cm. Right calf, 20$^{9}/_{10}$ cm.; left calf, 19⅘ cm. Entire right leg enlarged, but no tenderness or limitation of motion. Skin over leg is distinctly mottled and red. "Pitting of the skin" was very slight.

Laboratory and X-Ray Findings. Urine at all times normal. Blood showed a normal count. Wassermann negative. Radiograph of femora presented equality in size. Skiagraph was normal.

The above case being a congenital affair and no etiology encountered, it was looked upon as a dystrophy. It differed from Milroy's disease very materially. We note in this latter disease a persistent edema of both legs, which is familial. Milroy's series included 97 in 6 generations. My case lacked the typical Milroy syndrome, but did present a one-sided hypertrophy with slight edema and hence leads to the belief that it was a case of "persistent congenital hypertrophy of the right lower extremity."

CAUSE OF ADENOIDS (Riforma Medica, Naples, May 1, 1922). Brisotto found inherited syphilis certain or very probable in 56 per cent. of 150 children with adenoids, and tuberculosis in 24 per cent. In 8 per cent. there was both tuberculosis and inherited syphilis. Hypothyroidism was evident in 6 per cent., and in 2 per cent. there was a history of alcoholism or consanguineous marriages. He theorizes that the adenoid vegetations represent merely a defensive reaction carried to excess. Resection of the adenoids is only symptomatic treatment; it is useful only when associated with treatment to modify the general condition of the bone and lymphatic systems.—*Journal A. M. A.*

CHARLES D. MEIGS.

A Note on the History of Infant Feeding.

By A. Levinson, M.D.

Chicago

It is customary to start the history of modern infant feeding with the teachings of Biedert and Meigs, Philip Biedert's inaugural dissertation: "Investigations Concerning the Difference between Human Milk and Cows' Milk," published in 1859; and John Forsyth Meigs' book: "Milk Analysis and Infant Feeding," published in 1885.

Biedert is said to be the first man who showed that the casein of human milk is less in quantity than that in cow's milk, although his belief was that the casein in cow's milk is 5 per cent. and that in human milk 2 per cent. less, a fact that does not hold true in recent investigations.

Meigs is said to be the first American to assert that human milk contains less casein than cow's milk, and to make use of this fact in infant feeding. He believed that human milk contained only 1 per cent. of casein.

As a matter of historical justice I would like to make mention of the fact that long before the day of Biedert and John Forsyth Meigs, another American, Charles D. Meigs by name, published in 1850, a book entitled, "Observations on Certain of the Diseases of Young Children," in which he applied the work of Simon on the composition of human and cow's milk in its relation to infant feeding. Simon found that in human milk there are 32 parts of casein per thousand or 3.2 per cent. parts per 100; and in cow's milk there are 72 parts per thousand or 7.2 per cent. The full composition of the 2 types of milk according to Meigs' quotation from Simon is as follows:

Human Milk		Cow's Milk	
Water	898.0	Water	857.0
Butter	28.8	Butter	40.0
Casein	32.0	Casein	72.0
Sugar of milk and extractive matter	36.0	Sugar and extractive matter	28.0
		Fixed salts	6.2

Interesting is the discussion of Meigs following his quotation of Simon's chemical analysis: "The comparison of the cow's milk with the milk of the human female, showing the greater quantity of casein, may serve to explain the fact that, in substitution of cow's milk for the mother's milk, the child gets a greater quantity of casein, which may account for the frequent occurrence of indigestion after the use of the substitute. It is doubtless the casein which most commonly disagrees with the young child, and not the creamy or oily portion."

The above statement of Charles D. Meigs is the keynote to a theory held in pediatrics for many years, namely, that it is the protein that is the offending element in the nutritional disturbance of the infant.

Meigs' subsequent statement on the casein shows the lack of knowledge concerning the cause of curds in unboiled milk: "This (casein being the disagreeing portion of cow's milk) is shown by the examination of the napkins of the infant, on which, under circumstances of serious indigestion, are always found masses of casein or cheese. Sometimes these portions of undigested cheese are hard, white, resembling new cheese that is bought in the market—evidently a casein insoluble in the stomach." It is evident that Meigs referred to the hard casein curds which newer researches on infant feeding showed to disappear on boiling.

In passing it may not be out of place to remark that the book of Charles Meigs, besides its historical interest, is valuable for its many excellent observations and practical suggestions on children's diseases. The book is written in a very pleasing style.

PRIMARY MALIGNANT TUMOR OF LIVER IN INFANTS (Lancet, London, July 29, 1922). In collecting reported cases of primary growth of the liver, Dansie confined himself to those occurring in infants up to 2½ years. Altogether there are twenty-three cases. The age occurrence shows the greatest frequency in the first six months of life. He reports one case in which the tumor, a duct carcinoma, had doubtless originated in connection with the bile ducts, since the cells composing it nowhere resembled those of the liver parenchyma, nor was the growth of any green color suggesting that the cells of the tumor were functioning.—*Journal A. M. A.*

SOCIETY REPORTS

THE NEW YORK ACADEMY OF MEDICINE. SECTION ON PEDIATRICS.

Stated Meeting, Held March 9, 1922.

MARSHALL C. PEASE, JR., M.D., *in the chair.*

REEDUCATIONAL TREATMENT OF CONFIRMED STAMMERERS.

DR. L. PIERCE CLARK spoke of the difficulties of analyzing and synthesizing the complexities of normal speech and stated that speech was so much of a gesture of the whole personality that it would defy analysis until we had a better understanding of character and personality. The 2 points which the writer aimed to make in this paper were: (1) That in the more enduring types of stammering the essential fault lay deep on the character formation of which the stammering was but one of the symptoms, often the lesser. (2) That the manner of treating these types successfully included painstaking, consistent analysis and synthesis of the personality as well as proper systems of speech gymnastics. This view-point was not new; almost all workers on speech defects took the same position but failed to indicate more precisely the system of mental therapeutics for the personality as a whole by which one might overcome these essential or malignant types of stammering. All agreed that the individual must be treated and not the stammering. When we fully realized that the consideration of this speech disorder, purely as such, was but mere surface plowing, and that a mechanistic treatment of the fault solely was bound to prove a failure unless a good understanding therapy of the underlying defect present in each case was made, only then had we made a real advance in handling these speech disorders. As careful practising physicians we should not turn these cases over for diagnosis and treatment to laymen. In confirmed stammering with personality defect nothing less than a thorough neuropsychiatric training treatment would permanently relieve it. Dr. Clark cited in detail 3 cases of confirmed stammering in which the stammering was based upon as definite a constitutional defect as the severest forms of neuroses, or tics. Fortunately primary instinctive defects were usually easier of socialization than many another form of defect. In these 3 citations it was shown that there was a basic character fault preceding the stammering. In the main, it was summated in a shyness and timidity toward all forms of self-expression. The supersensitive nature marked the infantility of these 3 youths. Each showed the need of a change in personality, or, better, a development of the existing personality, but little was accomplished until the concrete means and a demonstration of its more enjoyable benefits were adequately placed before the pupil. One must first find the basic interest, then employ or mold it into a trial social group and one was then on the way to a lasting betterment in these cases. Perhaps one might recover in every case of stammering, as in the ones reported, that one in authority in the home had repeatedly repressed the self-expression of these constitutional stammerers. This would not be of such signal moment if these children, because of their inheritance and makeup, did not so illy bear such repression. The removal of the maladaptive wrappings of habit and manner, which the stammerer's personality possessed, was the real purpose in analysis and treatment. Viewed in this light of origin there could be little wonder that the confirmed stammerer had produced such a distorted personality which he must first be taught to shed and then to make the proper social and self-expression, consonant with his innate desires and station in life. He had to unlearn and relearn anew. The amount of sympathetic tact and inculcation of habits of broadly constructive effort which the trainer must exercise could hardly be overestimated. Nearly all confirmed stammerers were chiefly intent upon ridding themselves of their speech handicap solely. When they comprehended that only by consistently modifying the whole personality, especially that which underlay full free self-expression, they usually shrunk from the task. Bald preaching was not only time-consuming but most sterile of results. The habit training should perhaps begin or at least be consonant with the first efforts to overcome articulatory defects. Habit reeducation could be illustrated by concrete living examples of free and easy speech in newspaper and storied accounts and finally by creating situations requiring spontaneous natural effort at self-expression. At first changing situations could be created and then a judicious admixture of varied personnel could be introduced into the conversational group. But one, either the situation or the personnel, should at first be changed; later both might simultaneously be modified, thus increasing the agility of both adjustments. On many pupils the degree of repression had been so marked that many of the mental attributes, such as attention and memory, had suffered dwarfing. The earlier mental training must then be reviewed to intensify the concepts of reality and enlarge the association memory of things, for largely upon these 2 factors a keen and resourceful mind depended; this and the comparative and competitive interchange of ideas with one's fellows lay at the basis of developing intelligence in any large sense. The retraining of the stammerer should be continued until he is perfectly cured; the half-cured stammerer was a potential confirmed stammerer whenever some great social stress was reinvoked. Psychic reeducation oftentimes covered months or even years. The seeming neurotic element in the confirmed stammerer was confined solely to his substitutive reactions in seeking expression, and not to the fundamental defect of speech itself.

Discussion. DR. SMITH ELY JELLIFFE stated that in a moment of weakness he had acquiesced in Dr. Clark's request to discuss this paper. According to the chairman he had 5 minutes for the discussion. It was therefore with temerity that he undertook it. To try to discuss the problem of influencing the expressive side of a personality in 5 minutes did not amount to anything; at the same time he would begin and try to say something about what he had found was wrong with some stutterers. Personally, he did not enjoy treating stutterers, and nearly always sent them to someone else, but he was very much interested in putting his finger upon certain fundamental defects in their personality make-up. He was interested in the character defect which formed the basis of this disorder. In his attempts at an analysis of the mmm, ttt, sss or other types of stutterers he thought the particular sound difficulties meant something often quite definite. To convey just what he meant Dr. Jelliffe drew a circular diagram and said one could conceive of the fetus, which in 9 months had gone through the evolution of one hundred million years. This might be represented as the center of an enlarging circle which he divided into segments each representing different organ strivings of the individual. At birth these segments must come into harmonious relation with each other. The first segment in the circle he indicated as the respiratory system. The first cry started the processes of life on 3 levels, in the terms of Hughlings Jackson. The first is a biochemical requirement; the need for oxygen satisfaction. The second is physiological respiration, and finally there is a third, the cry, which is the symbol. In so far as the demand for oxygen is concerned in the new-born, it is met by a cry. Finding that the cry granted the satisfaction of the oxygen craving, the infant endeavored to meet other cravings by the same symbol. He cried when he felt something. It might be noted that 100 per cent. of the infant's energy went into the first cry.

A second segment in the circle represented the need of the infant for food. Having learned that a cry lead to the satisfaction of his first demands, he cried for food. Here he first learned that he could not "holler" and "swallow" at the same time. That was the first fifty-fifty struggle the child met with in life. The result was a *displacement* of interest in order to get from the cry to the swallowing. The mmm type of stutterers had never actually learned the first lesson that they could not cry and swallow at the same time. They "want their cake and eat it too." It was very difficult to cure the mmm type of stutterers. The struggle started so far back in infancy. In his study of neurotic conditions he had found that the amount of compulsion that lay back of the symptoms was in direct proportion to the age at which the fixation had occurred. If it began at an early age, it had almost the whole force of the personality behind it.

Continuing his chart, Dr. Jelliffe spoke of the next necessary type of craving that the child had to displace his energy. One hundred per cent. of his energy now went to the bladder. The infant found that if he wanted to urinate, he had to stop, partially at least, crying and swallowing. Another necessary early satisfaction was the function of defecation. These 4 different functions he had found distinctly valuable in classifying different types of stutterers. With the mmm type of stutterers the inability to cry and swallow at the same time was a manifest mechanism; in the sss and ttt type urinary fixations were playing a preponderant rôle. The bbb type, those who blew or burst their words out, were those in whom fecal phantasies were largely responsible. In other words, certain amounts of displacement of initial craving satisfactions were coming out in the defect shown in stuttering. In the group of stutterers, in whom the disorder occurred at these early level fixations, it took a long time to get well; they belonged to the compulsive or even the epileptiform groups. They were occurring in the organ erotic phase of psychological devolopment. If the speech defect were later, at from six to ten years of age, the narcissic or exhibitionistic level, which level in general represented the effort of the child to call the attention of his environment to *his* various individualistic type of performances, the prognosis was by no means so bad. These patients were often quite readily cured. Then there was another group in which the stuttering developed at puberty or later, under some special stress or strain. Cases of shell shock, which developed at puberty or later, under some special stress or strain, which developed speech defects were illustrative of the latter group, and most of these could be readily and successfully treated. In cases in which the stuttering developed at a deep level, prognosis must be given at least with a great deal of caution, and, for himself, Dr. Jelliffe said he treated such cases reluctantly feeling that unless one had a high grade of real intelligence, not book learning, the outcome was quite unpredictable.

MRS. E. W. SCRIPTURE said that after listening to 2 such eminent authorities she hesitated to say a word, since all she could speak of was the practical work. In her experience she had met just what Dr. Clark and Dr. Jelliffe had spoken of. Those cases of stuttering which had their origin at the lowest level were very difficult to handle; they were the ones no pedagogues could handle. The 3 stages at which most cases of stuttering had their origin were mostly the first initial ones, at the first school age and at puberty. It was of interest to note that the many statistics gathered all showed that boys were much more afflicted with speech disorders than girls. The girl was proverbially a smooth talker. It was rarely possible for a school teacher to undertake the cure of a stutterer without the aid of a neurologist and a psychologist; but the class exercises in muscle training, which engendered confidence in the individual, were of inestimable value. The cure of stuttering was, as Dr. Clark had so clearly shown, a matter of reeducation—an adjustment to environment which can mostly be secured by individual analysis and maintained through thorough and constant training. It was important to make a distinction between stammering and stuttering. The German stammeln meant to stammer or lisp, while stottern meant to stutter. It was important to make this distinction because to lisp was one thing and to stutter was another. We might define stuttering as difficult speech, stumbling, hesitating, repeating and restraining; and lisping, an organic disturbance, as mispronunciation. The *more* the lisper thinks of his speech the better; the *less* the stutterer thinks of his speech the better. Lisping was a mechanical defect which could quite easily be corrected, but stuttering involved a personality defect and required long, patient, individual work in order to overcome it.

Dr. Clark, in closing the discussion, stated that it was a singular thing in these cases that mere analysis of the fault, where it was a constitutional defect, was not sufficient to relieve the condition. In addition to the supportive reeducation, by analysis, there must be a very distinct understanding of the psychological development of the instinctive life. The reeducational feature was the one he particularly wished to emphasize, because in both the literature and the practical handling of these cases we had been led to suppose a cure might be effected along the way of approach to the initial fault. To effect a cure required both methods of approach and it was only by such a complete synthesis that the best results were attained.

SOME DIAGNOSTIC POINTS IN SCARLET FEVER.

(An Analysis of 1,500 Cases of Scarlet Fever).

Dr. Harold R. Mixsell read this paper. (Published in the New York Medical Journal and Medical Record, August 2, 1922.)

Discussion. Dr. Rowland G. Freeman said he did not know what experience most of his hearers had had with scarlet fever, but in describing typical cases of scarlet fever to students it had occurred to him that it had been a long time since he had seen such typical cases. He thought that scarlet fever at the present time was running a rather mild course. Not all cases had high temperature, very red throat and enlarged cervical lymph nodes. The temperature was not always high; usually the throat was red, and the cervical lymph nodes were usually enlarged, but the rash found was not typical and not well developed. Some of these atypical cases were very difficult to diagnose. He had seen one case in which the rash came out only on the flexor surfaces of the limbs, A man of large experience said it could not be scarlet as the scarlet rash always stayed out 24 hours and the rash in this case had not done so. Later this child desquamated. Dr. Freeman expressed the opinion that the real diagnosis of scarlet fever rested on a characteristic desquamation. Scarlet fever did some very peculiar things. There was usually a high temperature by the second day of the rash and the temperature then subsided, but he had seen cases in which it remained high up to the fifth day, the rash spreading and the temperature becoming higher each day. That condition was apt to alarm one as it suggested complications. The temperature would then come to normal without any complications at all. In some cases, after the first rise of temperature had subsided, there would be another rise in temperature and another rash and another enlargement of the cervical lymph nodes.

In his experience, Dr. Freeman said the dates for the appearance of nephritis were not exactly as Dr. Mixsell had given them. He thought they were from the seventeenth to the twenty-first day. If a child had not developed nephritis by that time one could allow him to get up without expectation of trouble.

Dr. Freeman recalled a small epidemic of scarlet fever at the Foundling Hospital during which there were 10 cases and none with a temperature over 101°, and some went on to chronic joint disease and heart disease, and all sorts of complications. During another epidemic at the Foundling Hospital, in March, which occurred at the same time as an epidemic of measles, there was one child with a denuded neck, the result of the breaking down of the cervical lymph nodes. Measles then began to crop out and there were many complications and the loss of many of the children. He persuaded the Sister in charge to put these very sick children on an enclosed porch. Those cases put on the porch were all either in the middle of, or recovering from, scarlet fever. After these children were put on the porch, there was no more mortality, and even the child with the badly denuded neck made a good recovery, and the denuded area healed completely.

Dr. William P. Northrup stated that at the Foundling Hospital in conjunction with Dr. O'Dwyer they had seen all sorts of irregularities presented by scarlet fever. Granting there were many essential signs, Dr. O'Dwyer had canvassed the field very thoroughly and they had come to the conclusion that sore throat was so characteristic that scarlet fever seldom ran its course without the hot, burning, sore throat. They had observed the symptoms during an epidemic and each patient stated that he or she had the hot burning sore throat, some complained of headache, and some vomited. There was no one symptom absolutely characteristic, but for purposes of help at the bedside the red throat was perhaps as good as any one.

Dr. Philip Moen Stimson stated that at the Willard Parker Hospital last winter there had been a great many cases of arthritis complicating scarlet fever; this year there were practically no arthritis cases. There was one feature that the resident physician on the service a year ago brought out by which she had been able to predict the cases which would-have joint manifestations. About half the cases that developed arthritis showed, during the 24-hour period before the first appearance of the joint inflammation a rather characteristic eruption of from 5 to 30 or more small reddish-brown spots on the body or extremities. Another point that had been of value in the diagnosis of scarlet fever and one that was applied with the British soldiers was that one always found the rash first on those portions of the body which were warmest or under pressure, as under the straps, under the arms, in the groin. The value of this point was so well recognized that the doctors were instructed to inspect these areas in suspected cases.

Dr. William P. St. Lawrence stated that there was considerable dispute among men interested in this subject as to the importance of scarlet fever as a cause of cardiac disease in children. Some workers thought that it had little bearing on this problem while others believed that scarlet fever was an important etiological factor. Still others believed the heart was more likely to show involvement if arthritis was present during the attack of scarlet fever. For this reason he would like to know Dr. Mixsell's experience on this point. Were the cases which he reported examined on admission and during the course of the disease? Was cardiac disease absolutely excluded at the onset of the attack of scarlet fever and upon what facts and according to what standards was the heart considered to be the site of new disease?

DR. MIXSELL, in reply to Dr. St. Lawrence's question, said he thought there was no standard for the heart cases. The findings on admission were simply filled in on the charts. Most of the cases considered in this study, Dr. Mixsell said, he had not seen himself. He agreed with Dr. Freeman as to the atypical course of scarlet fever. As they saw the disease at the Willard Parker Hospital all the signs were evanescent and disappeared rapidly. The only way one could be sure of the diagnosis was by finding desquamation or nephritis. He also agreed with Dr. Freeman that the primary symptoms might disappear and then there might be a recurrence with all the signs and symptoms of the disease. One found nephritis at the beginning of desquamation which might be from 5 to 21 days from the onset. In making the essential diagnosis, Dr. Mixsell said he agreed with Dr. Northrup in regard to the sore throat. When one found the strawberry or raspberry tongue, which desquamated and looked quite beefy, one could almost prognosticate the stage of the disease and certainly could make a diagnosis. The rash, it was true, appeared first in the warm areas due to skin apposition, the usual sites being in the axillary, popliteal and gluteal regions.

RESULTS OF ACTIVE IMMUNIZATION WITH DIPHTHERIA TOXIN-ANTITOXIN IN THE PUBLIC SCHOOLS OF NEW YORK CITY.

DR. ABRAHAM ZINGHER made this presentation which was illustrated by lantern slides showing the statistics collected in his work in the public schools of the city and in other schools and institutions. He called attention to the fact that there had been a large increase in diphtheria in 1921, from 50 to 200 per cent., in almost every state in the country. That had perhaps stimulated health officers to take an interest in the newer methods for the control of diphtheria, which were the Schick test and immunization with toxin-antitoxin. In the second place, the results obtained during the past 8 years by these methods had been very favorable, having shown that 85 to 100 per cent. of non-immune children became immune to diphtheria after the first series of toxin-antitoxin injections.

When it came to the work in the schools, they had met with great variations in the results of immunizing injections with the

the same strength and preparation of toxin-antitoxin. In retesting children, who had had one series of injections, the discrepancies varied all the way from 75 to 80 per cent. of successful immunizations in some schools, to 25 to 30 per cent. in other schools. It was found that the percentage of those becoming immune after receiving one series of injections of toxin-antitoxin was in inverse proportion to the percentage of positive reactions following the original Schick test. Where the number of positive Schick tests was high, the number of children becoming immune after one series of injections was low. The reverse was likewise true. It was found that the children in the schools in the poorer sections of the city gave fewer positive reactions to the Schick test and responded to the toxin-antitoxin injections with a higher percentage of immunes than the children in the better sections of the city among the well-to-do. They had obtained as high as 60 to 70 per cent. of positive Schick reactions with the original test in schools located in certain sections among the better classes, while in schools in the crowded sections of the city only 15 to 25 per cent. gave positive Schick tests. The explanation was that the children in the poorer sections were often exposed to mild doses of diphtheria organisms which brought about a certain degree of natural immunity. Among the children of the better classes this exposure was not present, because they were segregated and isolated, and they therefore remained susceptible. It was evident that the toxin-antitoxin brought about a better response in the children in whom antibodies had been stimulated by previous exposure. Even if they still gave a positive Schick reaction they responded readily to the series of immunizing doses of toxin-antitoxin.

Dr. Zingher stated that he had seen no harmful results from the Schick test and the toxin-antitoxin injections. In some there was a little fever and a sore arm but these reactions rapidly cleared up. He had thus far tested over 100,000 children and expected soon to finish testing the children in every school in Manhattan and the Bronx. Among all these tests and injections he had not seen one case of infection.

In closing, Dr. Zingher made a strong plea for the active immunization of all children of the preschool age. In order to bring about an immune child population it was necessary to begin early and to immunize all children from one to five years of age, inasmuch as 85 per cent. of the cases of diphtheria occurred in this age group and the large proportion of deaths from diphtheria occurred among this group. Injections of toxin-antitoxin in the new-born brought about very little immunity, as at this time the infant was protected by the antibodies it had brought over from the mother. The injections were effective, however, after the child reached the age of 6 months.

Discussion. DR. EVERETT W. GOULD stated that these reports which Dr. Zingher had made regarding the results of the Schick test and toxin-antitoxin immunization in the public and private schools were most interesting and valuable, for it was only from the results of thousands of cases that it would be possible to formulate the position which the practicing physician should take in respect to the use of this method of controlling diphtheria. He felt that Dr. Zingher was probably not yet ready to state what the Board of Health would recommend as the universal practice of the medical profession on this subject, and it would be too much to expect him to state the definite details of such a far reaching problem. But he felt quite sure that the goal for which they were striving was that every child should be required to be vaccinated against diphtheria just as he is now required to be vaccinated against small-pox. Before that time could come it would be necessary to educate both the physician and the public. In order to accumulate definite data on the subject it was important that everyone who had access to material should use it as scientifically as possible. Today, Dr. Gould said, he thought there was no one who had done scientific work who doubted that the Schick test, when properly done and properly interpreted, was a reliable measure of sufficient antitoxin to protect the individual against diphtheria. If now we had a method by which an active and persistent immunity could be aroused in an individual, we should encourage any work which would ultimately determine the details of this method. There naturally would be much discussion and differences of opinion in regard to the size of dose, the strength of the toxin and the length of time the immunity would last. There was also the question as to the time when it should be given. It was useless to give the immunizing injections during the first 6 or 8 months of life because the child was passively immunized during that time by the antibodies it had inherited from the mother. If one waited until the child was in school there were a good many bad reactions which reflected on the teacher and the doctor and brought the procedure into disfavor. Furthermore, it was important that the immunizing injections be given in that period of life when the child was most susceptible, namely, from 2 to 6 years. The Board of Health could not easily compel the giving of toxin-antitoxin to every child 2 years of age, but they could compel every child to show a certificate that he had a negative Schick before he could enter school just as they compelled every child to show a certificate of vaccination against small-pox, and this would have an influence in having children vaccinated against diphtheria at an early date. The public would be willing to do this when they saw that the incidence of diphtheria was actually diminished by this procedure. Even more important than the statistics which had been shown this evening would be the statistics in regard to the incidence of diphtheria in schools in which the children had been immunized and it is hoped that these reports will be much more convincing to the public and the profession and lead to a hearty cooperation on the part of all.

OXYGEN THERAPY IN PREMATURE INFANTS WITH CYANOSIS.

Dr. Harry Bakwin said that cyanosis was a frequent symptom in premature infants. It might be associated with a number of different conditions, such as cerebral hemorrhage, bronchopneumonia, sepsis, etc. Not infrequently, no organic basis was found for the cyanosis, except, perhaps, for a few atelectatic patches in the lungs. Usually, a diagnosis during life was impossible. Whatever the cause, however, cyanosis was an extreemly grave symptom and required immediate treatment.

The method of administration of oxygen is of the greatest importance. The funnel method, which is so widely used, is almost useless. The widespread use of this ineffective method of oxygen administration has done much to discredit oxygen therapy.

At the New York Nursery and Child's Hospital, oxygen is given by means of a rubber tube about ¼ in. in diameter, with a hole in the end of the tube. The tube is inserted into the infant's mouth and held in position with a glass collar which fits snugly over the tube. The collar is held in place with tape, which passes through perforations in the end of the collar and is tied back of the head. This collar was demonstrated. This simple device eliminates the need of a nurse in constant attendance during the oxygen demonstration.

The results of oxygen demonstration in 2 infants with severe cyanosis were reported. In both these infants the cyanosis entirely disappeared, the babies becoming rosy pink in color, the pulse was markedly improved and the oxygen unsaturation of the blood, which was very high in both instances, fell to normal. One of the 2 infants thus treated was now 5 months of age, and seemed in every respect a normal baby.

Discussion. DR. LOUIS C. SCHROEDER said he did not know of any finer test of a man's fitness as a pediatrist than his ability to offer an explanation of cyanosis in prematures and to outline a rational treatment for it. The reason pediatrists knew so little about premature infants was because, in their initial training in pediatrics, they had little opportunity to see the new-born, and as a corollary it followed that there had been little work attempted such as Dr. Bakwin had done. Much time was spent in talking of lowering the mortality from the various causes in infancy and much had been done in a preventive way, while little was being done where it was most needed. Since Haldane's work had been published, showing that when oxygen was given by a funnel 98 per cent. of it was lost in the air, it was not being given in that way. The glass collar which Dr. Bakwin had devised kept the child from closing his teeth on the tube and shutting off the oxygen. The oxygen tent had been suggested as a means of administering oxygen but Dr. Schroeder thought the problem would not be solved until someone devised an oxygen chamber. The work of Meltzer and Haldane suggested that it was time for some of us to see if we could not place oxygen therapy on a sound basis because oxygen was certainly a tremendous help in certain conditions. We must remember that anoxemia had a distinct effect on all the bodily structures, especially the brain, leading to permanent damage. That being true, how great must be the effect of a lack of oxygen on the tissues and brain of a 4 pound baby and how little chance he had of surviving, unless cyanosis was relieved.

THE PHILADELPHIA PEDIATRIC SOCIETY.

Stated Meeting, Held January 10, 1922.

HORACE H. JENKS, M.D., PRESIDENT, *in the Chair.*

THE EYES OF THE GROWING CHILD.

DR. EDWIN B. MILLER, said: The principal occupation of the child is to grow; the principal occupation of the parent is to see that opportunities for growth are supplied and to remove hindrances to proper growth and development. The civil authorities should provide the proper facilities in the way of sanitary control, housing and hygiene, the medical profession supervising the work of preventive medicine; the parents coöperating in the work of building up a nation of physically fit citizens.

We have been rather lax and indifferent to the eyes of the growing child; about this I wish to speak. It is not my purpose to consider external inflammatory eye conditions, but to confine myself to the muscular anomalies seen in children. The first person to notice a deviating eye is the mother. She immediately consults her physician about it, stating that following a slight fall or fright, or on recovering from one of the exanthemata, she noticed the eyes were turned. What has happened? First, the child has had a weak or poorly developed fusion faculty as a predisposing cause. Second, the shock of the fall or fright, the muscular weakness following the acute fevers have disturbed the ocular balance, which cannot recover itself because of the faulty fusion faculty, and the eyes deviate.

What should the pediatrist know about the eyes of the children under his care? He should be in a position to intelligently advise the parents as to the significance of any eye trouble and to suggest the course of procedure which the parent should take in having the deformity corrected.

At birth a child does not recognize objects and the eyes often wander from parallelism. Later, as it begins to notice things, one eye may occasionally deviate. Up to the first year, this is not harmful, the fusion center not being sufficiently developed to enable the child to fix and secure binocular single vision. If, after the first year, the eyes wander from parallelism, there is something wrong. At this time the physician often advises the parents to wait and see if the child will outgrow it.

Some neurologists do not recognize the existence of a fusion center. We know that the coordination of functions by which we obtain binocular single vision has reached its maximum, and cannot be developed after the sixth or seventh year. If not carefully studied before the seventh year, little can be done to improve the vision.

The object that we see makes an impression on the two retinas at exactly the same relative position. This impression is carried to the brain and fused into one image. If the fusion center is weak or poorly developed, we do not fuse the 2 objects together, and we get a double image.

Physiologic. Hold a pencil in front of the face about a foot away. While looking at it, also look at a distant point, you will see 2 pencils.

Muscle Anomalies. There may be weak innervation of a definite muscle, the muscle may be structurally weak, or it may be misplaced as to its anatomical insertion, and the eyeball may be shifted from the parallel position, and you have diplopia. The patient will try to overcome it by turning the eyes, by turning the face and tilting the head, in trying to fuse the objects. Failing in this, they suppress the false image in the brain, and begin to use the eye which focuses on the true image. The other eye wanders from parallelism and you have one of the manifest squints. This eye eventually becomes amblyopic, and nothing can be done for its vision.

The child with a latent muscle imbalance (aphoria) suffers from headache, nervousness and other reflex nervous phenomena which makes it irritable, and handicaps it in its school work; the child with manifest squint or tropia becomes self-conscious and ashamed of the deformity. Loss of vision occurs in the squinting eye and the child is crippled for life.

Treatment. The first thing is not to dismiss the case with the statement that the child will grow out of it. Remember that squinting eyes become amblyopic, that children a year old can be refracted and wear glasses, that the occasional instillation of atropin in the good eye, compels the squinting eye to straighten up and exercise its function, that bandaging the good eye for a couple of hours daily also helps, that the amblyoscope can be used in very small children to train and strengthen the fusion faculty.

The devices used in fusion training are of 3 classes: 1. Those which do not require blending of images, but simultaneous vision of dissimilar objects, as the bird and the cage. 2. Those which require true fusion of images. The picture on each slide is similar except that a different part of the design is omitted in each picture. In one the man has no hat, in the other he has no leg. 3. Those which require a sense of perspective as the picture of 2 circles eccentrically placed, which gives the impression of looking into the depth of a tube. The parents can be taught to use the amblyoscope and the treatment can be carried out at home.

If the eyes are not held in parallel by glasses, or by the methods of treatment I have described, various operations on the muscles can be performed successfully, at a much earlier period than was thought possible some years ago. Oscar Wilkinson, of Washington, D. C., operates at any age if the amount of deviation makes it impossible to secure binocular single vision and if, after using atropin, pads, exercise or glasses, the condition has not improved after one year's trial. The youngest child that I have glassed was 14 months old; the youngest on which I have operated, was 2 years and 8 months.

THE PHILADELPHIA PEDIATRIC SOCIETY.

Stated Meeting Held February 14, 1922.

Horace H. Jenks, M.D., President, *in the Chair.*

HEART BLOCK IN A CHILD OF FIVE YEARS.

Dr. M. Jane Sands, said: Heart block in children is relatively infrequent. Records of 19 cases are to be found; of these, the best survey is by Eyster and Middleton. In summarizing, the following facts appear: The cases were observed between 1896 and 1920, in France, Germany England, The Netherlands and the United States. The age limits were 15 months to 15 years, the majority being between 2 and 5. The duration of the disturbance presented wide limits, from 3 days to 6 years. There was a fatal termination in 5 instances, after intervals varying from 3 days to 4 years; 2 recovered completely, in 13 the lesion had continued to the time of publication (1920).

A rough division into 2 groups could be made; those having congenital lesions and those associated with an acute infection. In the first group, 8 cases were listed as congenital and one as "cardiac tumor"; in the second were 10 cases, 5 postdiphtheritic, one rheumatic, one following bronchitis, one associated with an undetermined pyogenic infection, with an acute tonsillitis, and one of wholly undetermined origin.

CASE REPORT. M. H., aged 5 years, was admitted to the Children's Hospital suffering with diarrhea and a skin disease. The diarrhea followed an acute attack of abdominal pain, succeeded by faintness, and blueness of the lips, hands and feet. The father, who was 42, suffered with psoriasis (the father's Wassermann is negative). The patient was the sixth of a family of 8, 2 of whom died in infancy of pneumonia. The others were well.

When the mother was 8 months pregnant, she contracted pneumonia and on the fifth day of her illness the patient was born. The child was said to have had pneumonia at birth. She was never breast fed, no food was well taken, and when 6 weeks old weighed only 4½ pounds, a half pound less than the birth weight. When 3 months old, she began to gain and improved steadily until she was 5 months old, when she had whooping-cough and pneumonia. From that time until the present, she has had diarrhea. "The movements are loose, smell sour, sometimes have blood, and she seems not to have any control." Measles, mumps and chicken-pox occurred in succession during the second year, and scarlatina, during the fourth year. Tonsillitis has occurred about once a year. Growth has been slow. A brother, 2 years younger, is a head taller.

She has had three attacks of an unusual nature; one of these initiated the illness for which she was brought to the Children's Hospital. The first attack occurred on a Hallowe'en, soon after the scarlatina, when the child was 4½ years old. The mother found the patient was blue in the face, hands and feet. The eyes were rolled up, she was not unconscious but seemed stiff.

Later the arms jerked slightly. A physician was called, but did not see the child until morning, when a diagnosis of "indigestion with convulsions" is said to have been made. The second attack was 4 months later and took place in the daytime. The first complaint was of pain in the stomach; after vomiting, she became stiff and blue. It is uncertain whether she was unconscious. The third and present attack happened about 5 months afterward and was similar to the second, excepting that it was followed by an acute attack of diarrhea with fever. During these attacks she has never cried out, never fallen or hurt herself, never had true convulsive movements, and always required 4 or 5 days to recover her normal state.

Physical Examination. The patient was an undersized fairly well nourished child. The whole person, except the face, was covered with psoriasis. Complete examination showed no gross abnormality aside from a slight enlargement of the heart. The heart rhythm was regular and no murmur was heard. The urine had no albumen and no casts; the Pirquet test was negative; the Wassermann was negative; an x-ray examination showed no enlargement of the thymus. The pulse rate was constantly slow, being from 48 to 60 per minute.

There was a delay in conduction between the auricle and ventricle shown by the increased time intervened between the auricular impulse, the P-wave, and the ventricular impulse, the R-wave. Following exercise, the delay became more marked with the P. R. interval increasing in each cycle, until finally the ventricle entirely failed to respond to the auricle. Even with the vagus paralyzed by atropin, the block persisted. The tracing, taken 6 months later, still shows an incomplete heart block though the ventricular rate has increased to 60.

The child has been under observation for 9 months and continues to show a heart block. No treatment has been directed to the cardiac lesion, the whole effort being expended in trying to get her general condition to par. She has gained 3 pounds and is beginning to play as the other children. The lesion has changed from complete block with a rate of 48 to incomplete block with a rate of 60.

Due to the courtesy of Dr. J. C. Gittings and Dr. J. J. Reilly of the Children's Hospital I was able to study this case and to make electro-cardiographic studies.

BOILED BUTTER VERSUS CREAM IN INFANT FEEDING.

Preliminary Report.

Dr. Harry Lowenburg said: The need of the growing organism for fat need not be discussed. The etiological influence of bovine butter fat in acute alimentary disturbances, occurring in the artifically fed suckling, appears to be well established. Between these 2 activities, one constructive, the other destructive, we have labored to find a happy solution to the problem of how best to supply this much needed aliment so that it will be digested and assimilated without producing irritation with resulting loss of weight which is usually the condition for which it was originally added. Many means have been devised to physically or chemically change the character of butter fat of cow's milk or to determine upon a suitable substitute for it. Pancreatization, the complete or partial elimination of it by the use of skim or partially skimmed milk and the substitution of extra carbohydrate, have been the means most proposed and productive of results. Griffith and Mitchell, in the New York Medical Journal, Nov. 1921, quote the experiences and opinions of a host of observers which seemingly prove that fat is a food element essential to the growing child. Knowledge of its power for harm has caused many to underfeed with this substance. Others continuously overfeed with it. It becomes plain therefore why many cases which are losing weight on high fat mixtures will start to gain when fed low fat, because they absorb and assimilate that which they imbibe without irritation. When in these cases it becomes necessary to increase the fat, it cannot always be accomplished by the usual method without producing an acute upset. The problem has been to find a way of supplying this needed fat in sufficient amount and in a form acceptable to the digestive apparatus. This seems to have been solved by the so called butter-flour mixture of Czerny and Kleinschmidt. Griffith and Mitchell quote many observers, the majority of whom have had splendid results and they also report at length their own successful experience with 40 cases. I have employed the butter-flour mixture largely with good results. The purpose of this communication is simply to detail my experience with the simple addition of boiled butter, instead of cream, to ordinary skim milk dilutions containing nothing more than skim milk, water, sugar and salt with or without the addition of starch. The reason why it is possible to feed the large amount of fat as represented in the butter-flour mixture and not feed the same amount as represented by cream or top milk has not been stated definitely by the clinicians who report their experiences with this method. Some have conjectured that it is due to the driving off of the volatile fatty acids and others that it depends upon the browning of the flour in the process of making. The latter seems untenable as browned flour as represented by the prepared flour ball has been often employed in mixtures wherein the fat was represented by top milk or cream and the tolerance of the infantile digestive apparatus for the extra fat so provided was not improved. The matter appeared to merit investigation and the problem was first attacked clinically and later confirmed by chemical study. The theory that the tolerance for bovine butter fat as found in the butter-flour mixture depended upon the equality of proportion between the amount of flour and that of butter being maintained did not appeal and it did not work out clinically for in my experience with this mixture I have often found it necessary and helpful to reduce the quantity of flour on account of constipation and gaseous distention. While the infantile digestive apparatus is the last arbiter as to the digestibility and assimilability of any formula it seems a bit too much to credit these organs with brains and temperament that would cause them to reject food simply because it did not correspond to a man made rule that such and such ingredients must exist in equal proportion!

At first butter (boiled slowly 5 minutes) in measured quantities instead of cream was simply added to skim milk dilutions without reference to the fact as to whether they contained flour or starch in any form. In the beginning, very small amounts were added as ¼ of an ounce to a 30 or 40 ounce mixture. Gradually these quantities were increased until 2 ounces to a 30 or 40 ounce skim milk formula have been employed. It was found to agree surprisingly well as indicated by the protocols of the 13 cases occurring in private practice and herewith submitted. The number of cases is small but it is thought they constitute a sufficient nucleus to warrant further investigation and to indicate with a certain degree of probability that the success lay in the boiling of the butter.

Gain in weight was maintained. In one case, a gain of 16 ounces was recorded in 3 days. Vomiting was not inaugurated and in many instances ceased. In one case of partial pyloric obstruction, doing well on thick farina, the boiled butter was added to the cereal without a renewal of the vomiting. In no instance was diarrhea recorded. The stools remained normal and even in some cases were constipated. The reaction was invariably feeble or markedly alkaline. In one case of diarrhea, which had been given the usual treatment, consisting of a hunger period of saccharated tea for 24 hours, followed by a protein milk, after constipation had occurred, the boiled butter was gradually added to the protein milk mixture without causing a repetition of the diarrhea. It was thus clinically determined that this substance was tolerated in a variety of conditions where, from previous experience, it was felt that the addition of cream would have been a hazardous undertaking. The tolerance for boiled butter without the addition of starch having thus been determined clinically it was decided to study why boiled butter possessed this advantage over raw butter and cream. The fatty acids contained in bovine butter fat have long been recognized to exist in a much less stable combination than those found in human milk and in order to determine whether the tolerance for boiled butter depended upon the complete or partial dissipation of these acids by reason of the high degree of temperature to which they were subjected, the following experiment was undertaken at my suggestion by Dr. A. I. Rubenstone of the Mt. Sinai Hospital:

A. 1. 100 c.c. of melted sweet butter, unboiled, bought in the open market were tested for total acidity in terms of deci-normal sodium hydroxid solution and it was found that 27 c.c. of this solution were necessary to accomplish neutralization. 2. After boiling 100 c.c. of sweet butter slowly for 5 minutes it was found that 11 c.c. of the deci-normal sodium hydroxid solution were necessary to accomplish neutralization.

B. 1. 100 c.c. of melted salted butter, unboiled, bought in the open market were tested for total acidity in terms of deci-normal sodium hydroxid solution and it was found that 29 c.c. of this solution were necessary to accomplish neutralization. 2. After boiling 100 c.c. of salted butter slowly for 5 minutes it was found that 14 c.c. of the deci-normal sodium hydroxid solution were necessary to accomplish neutralization.

C. 1. 100 c.c. of cream, unboiled, bought in the open market were tested for total acidity in terms of deci-normal sodium hydroxid solution and it was found that 28 c.c. of this solution were necessary to accomplish neutralization. 2. After boiling 100 c.c. of cream slowly for 5 minutes it was found that 22 c.c. of the deci-normal sodium hydroxid solution were necessary to accomplish neutralization.

These experiments may be briefly expressed as follows: It appears that the total acidity of salt butter is slightly in excess of that of sweet butter and that that of cream corresponds about to that of salted butter. Further, it is noted that boiling reduces the total acidity of both sweet and salted butter by a little more than half and that this is most pronounced in the case of sweet butter. The most striking feature however of this experiment is that comparing the effect of boiling upon both sweet and salted butter with that upon cream that there is comparatively little effect from boiling upon the latter. By this simple investigation it appears therefore that an explanation is available as to why cream, when added boiled or unboiled to milk formulae, frequently causes acute alimentary disturbance as manifested by vomiting, diarrhea and loss of weight. On the other hand, it appears patent as to why the addition of either boiled sweet or salted butter is without this effect and the preference seems to point toward sweet butter although clinically no difference in effect has been experienced. Mere boiling of milk and cream mixtures does not assist in the digestion of fat, although it does improve the digestibility of the curd. It was noted while boiling butter that, without decreasing the degree of heat which is necessary to originally cause boiling, ebullition would cease and from thence onward charring or carbonization occurred, the effect of which was to cause the formation of a brownish or black sediment. It was therefore determined to learn if possible what relationship, if any, existed between the duration of the boiling and the reduction of the acidity. With this in view Dr. A. I. Rubenstone at my suggestion kindly carried out the following experiment. The numerals express the number of c.c. of deci-normal NaOH solution necessary to bring about neutrality.

Sweet Butter: Before boiling, 26.4 c.c. Boiled 1 min., 17.2 c.c. Boiled 2 min., 14 c.c. Boiled 3 to 4 min., 13.8. Boiled 5 min., 13.5.

These figures are averages obtained from repeating the operation 4 times. It will be noted that practically the same degree of reduction is obtained from boiling the butter 2 minutes as from the longer periods. Two minutes therefore would seem sufficient for clinical purposes inasmuch especially as charring does not occur.

ON CHRONIC NASOPHARYNGEAL INFECTION, CHRONIC TOXEMIA, AND DISTRESSED HEART IN CHILDREN (British Medical Journal, July 2, 1921). C. Paget Lapage calls attention to the following facts: 1. That chronic infection of the nasopharynx serves as one of the most important foci from which organisms may generate toxins which cause a chronic lowered state of health in the child. 2. That nasopharyngeal infection may be due to different kinds of organisms, the influenza bacillus being an especially potent factor and often acting as the initial infecting agent, though it may not remain in the nasopharynx. 3. That this toxemia often gives rise to heart lesions, and that, though these heart lesions may be valvular, they are often of quite a different nature from valvular lesions—that is, they are more in the nature of nervous irritation than of inflammatory troubles affecting the heart. 4. That these special forms of heart trouble need methods of diagnosis which are not usually employed, while they also need different treatment from that usually prescribed. Before diagnosing toxemia following nasopharyngeal infection other conditions and toxemias must be carefully excluded. The symptoms of breathlessness, pallor, and chronic lassitude may be common to both infective and noninfective cases. These same symptoms may be produced by bad hygienic conditions, underfeeding, lack of sleep, and mental stress. A few days' rest in bed, when the condition is due to these causes, results in great improvement and serves to differentiate these cases from those due to infection. In the infective cases, removal of obstruction, if it be present, attention to the nasopharyngeal toilet, and proper physical exercise and drill have proved of great benefit. In other words, some cases of irritable heart disease in children should be treated by exercise and not by rest. The x-ray is often useful in differentiating the dilated from the nondilated heart and in determining whether rest or exercise is the appropriate treatment.—*Medical Record.*

DEPARTMENT OF ABSTRACTS

Conducted by

Wm. Henry Donnelly, M.D., Brooklyn, N. Y.

White, Park J. and Veeder, Borden: A Study of 443 Cases of Hereditary Syphilis with Especial Reference to Results of Treatment (American Journal of Syphilis, July, 1922, p. 371).

White and Veeder find that a given case of hereditary lues has a fair chance of clinical and serological improvement; that such recovery or improvement may seemingly take place on little or no treatment, but that the chances are better in the cases thoroughly treated with arsenicals and mercurials. One is justified, therefore, in treating a case of hereditary syphilis with the expectation that it will be benefited. Despite intensive treatment, however, only 22 per cent. of the writers' cases are known to have been cured or recovered. The problem is best attacked by reaching the syphilitic mother before and during pregnancy. Therefore in this regard the prenatal clinic is more important than the pediatric clinic, and the only satisfactory solution of the problem lies in its prevention rather than in its cure. W. H. D.

Babonneix, L. and Hallez, G. L.: Infantile Cerebral Hemiplegia with Hemianopsia (Gazette des Hopitaux, August 8 and 10, 1922, p. 997).

This combination of hemianopsia in the course of an infantile cerebral hemiplegia was first described by Freud in 1889 and later by Vogt. It is sufficiently rare in the writers' opinion to report a case in a child of 22 months with a history of convulsions at 6 months and again at 17 months. The head and eyes were kept constantly turned to the right and when a light was brought near the child's left side there was no evidence that the child was aware of its presence, whereas the light on the right side attracted attention and the eyes followed it when it was moved. The eyegrounds were normal, the Wassermann was negative; however, improvement followed 2 subcutaneous courses of injections of sulpharseno. W. H. D.

HAMBURGER, FRANZ: THE FREQUENCY OF TUBERCULOSIS IN CHILDHOOD (American Journal of Diseases of Children, June, 1922, p. 481).

Hamburger believes that the Pirquet test for tuberculosis is inexact, and that the figures based on this test alone are wrong. He believes that to estimate the frequency with which tuberculous infection occurs in various periods of childhood it is necessary to properly select the material to be examined. The test can be done in children from schools, or hospitals for infectious disease, but not in children for dispensaries. The proper method of applying the tuberculin test is the subcutaneous injection of from 1 to 10 milligrammes after a preceding cutaneous or percutaneous application. The cutaneous or percutaneous method alone cannot be used. W. H. D.

WOLLSTEIN, MARTHA: HEALING OF HYPERTROPHIC PYLORIC STENOSIS AFTER THE FREDET-RAMMSTEDT OPERATION (American Journal of Diseases of Children, June, 1922, p. 511). The writer states that the lesion in hypertrophic pyloric stenosis is a hyperplasia of the unstriped muscle cells of the circular coat, while the connective tissue is not increased. After the operation, healing is brought about by the cells of the serosa and submucosa, but the unstriped muscle cells take no part in the process. The wound in the pylorus is healed within 9 days; the pylorus has become relaxed within two weeks. The stomach has returned to normal within a month, and the gap between the cut ends of the muscle coats has disappeared in 6 weeks. In 2 years only a thin line of connective tissue fibers separates these 2 muscle ends, and the stomach is quite normal. In contrast to gastroenterostomy, which leaves the pylorus unchanged, the Fredet-Rammstedt operation cures the pyloric lesion. W. H. D.

PARK, JAMES H., JR. AND MICHAEL, JEFFREY C.: A PECULIAR ERUPTIVE DISEASE OCCURING IN INFANCY (American Journal of Diseases of Children, June, 1922, p. 521).

The writers report 21 cases of this disease which seems to be identical with that described by Zahorsky and others. The onset was abrupt, with high temperature which reached its maximum on the second or third day, dropping, usually by crisis, on the third to the fifth day. With the fall in temperature, a rash appeared, most often on the buttocks or sides of the neck, beginning as discrete macules 2 to 3 millimeters in diameter. At its height it was most profuse on the trunk and least intense on the extremities. The efflorescence reached its height in 24 hours, lasted another day, and disappeared without desquamation. There were no complications or sequelæ and physical signs were negative. Blood counts showed moderate leukopenia and lymphocytosis.

W. H. D.

COZZOLINO, O.: A NEW SIGN IN TRACHEO-BRONCHIAL ADENOPATHY IN CHILDREN (La Pediatria, August 1, 1922, p. 690).

Cozzolino describes his new sign of tracheo-bronchial adenopathy in childhood as a dilatation of the thoracico-epigastric veins which are the result of the anastomosis of the long thoracic vein with the superficial epigastric vein. In normal conditions these veins are not visible, but from intra-thoracic pressure they are so engorged and prominent as to be easily seen. Naturally, this sign must be elicited when the child is at rest and not struggling, and it is made out much more easily in thin than in fat children.

W. H. D.

TAYLOR, W. M. AND MOORMAN, L. J.: DIRECT EXPOSURE TO TUBERCULOSIS IN INFANCY AND CHILDHOOD AND ITS RELATION TO MANIFEST PULMONARY TUBERCULOSIS IN THE ADULT (Southern Medical Journal, September, 1922, p. 692).

Taylor and Moorman report the results of a study of 223 children under 16 years of age with special reference to direct exposure to tuberculosis. The conclusions drawn agree with those suggested by Baldwin and Gardner in 1921, and are as follows: Childhood infection is almost universal. Heavy and moderate infections, especially in the first 4 or 5 years of age, depend on the history of direct contact. After 5 years of age, many cases show heavy or moderate infection without history of direct contact. This increase in the number of cases showing heavy or moderate infection after 5 years without history of contact would suggest that massive or gross infection is not due to a single large dose of tubercle bacilli, but rather to the cumulative effect of repeated small doses. The x-ray is perhaps the most valuable method of determining the degree or extent of infection, but it should be employed in the diagnosis of clinical tuberculosis only in connection with a thorough study of the history and a complete physical examination. There seems to be a definite relation between childhood exposure and manifest pulmonary tuberculosis in the adult, as shown by the fact that routine history taking showed childhood exposure in 62 per cent. of 200 adult cases. W. H. D.

GRAHAM, H. BOYD: THE MANAGEMENT OF DIABETES MELLITUS IN CHILDREN (Medical Journal of Australia, July 22, 1922, p. 89).

Graham writes that at the outset of treatment he has reduced the diet until the urine was sugar free; then a vegetable diet has been gradually increased until glycosuria was detected. The intake just short of this point has been regarded as the "carbohydrate tolerance," and then protein in the form of boiled fish has been added to the diet, and later lean meat, milk or egg has been gradually added to build up an optimum diet. It was noted that on a mixed diet the actual carbohydrate tolerance was higher than the estimated tolerance. The patients appeared to benefit by activity, such as walking, and massage and warm clothing have been used to bring an increased supply of blood to the muscles and peripheral tissues. Fluids have not been withheld, but in the presence of polydipsia, broths and beef tea have been sparingly administered on account of the protein and fat content. W. H. D.

CONROY, JOHN M. AND LAIRD, A. T.: ESSENTIAL FINDINGS IN PULMONARY TUBERCULOSIS IN CHILDREN (Minnesota Medicine, September, 1922, p. 534).

The only absolute conclusive finding in diagnosis of tuberculosis of the lungs is the presence of the tubercle bacillus in the sputum. However, there are other important evidences, several of which taken together may form a basis for an opinion. These are exposure to infection, occurrence of predisposing causes, physical signs in the chest, characteristic x-ray findings, positive tuberculin reaction, symptoms relating to the chest, and constitutional signs and symptoms. Of 86 cases, where a diagnosis of pulmonary tuberculosis was made in the Nopeming Sanitorium, only 21 cases or 24.2 per cent. had tubercle bacilli in their sputum. This is partly explained by the well-known difficulty in obtaining sputum from children. At this institution swabs are made from the pharynx, and sometimes from the larynx in cases with negative sputum, and samples of the feces are injected into guinea pigs by the Alexander method. The results are not yet available for publication. The Pirquet reaction was positive in 29 per cent., negative in 7.5 per cent., and unrecorded in the remainder. Cough was present in 87 per cent., fever and rapid pulse in 95 per cent., hemoptysis in 7 per cent., loss of weight in 91 per cent.

W. H. D.

O'BRIEN, FREDERICK W., AND AMES, FORREST B.; ROËNTGEN RAY AND TUBERCULOSIS IN INFANTS AND CHILDREN (Boston Medical and Surgical Journal, August 24, 1922, p. 279).

The authors report a further series of 34 infants and children studied from the standpoint of correlating roëntgen ray and clinical findings. These are added to a previous group of 44 and make a total of 78 cases from which certain conclusions have been drawn. A complete total of 20 cases of chronic pulmonary tuberculosis were found in the series of 78 under 14 years of age, or over 24 per cent. The roëntgen ray was of definite help in determining the site, extent and type of lesion in each of the positive cases. Eight cases which were negative, clinically showed typical markings of pathology caused by the tubercle bacillus. From a preventive standpoint, the x-ray examination and findings in the chest of children is of great help. W. H. D.

GROSSMAN, JACOB: THE CARE OF THE FEET DURING CHILDHOOD (The Nation's Health, June 15, 1922, p. 338).

The writer reminds us that the fat pad of the arch of the foot begins to disappear in the second year of life and is completely gone after the third year. Hereditary predisposition to weak feet must be emphasized, while acquired weak feet are due to many conditions. These are general muscular relaxation, infantile paralysis, rickets, especially with genu valgum, injury, prolonged confinement in bed, inflammatory or infectious conditions around the ankle and foot. The pedograph or graphic record of the foot is of service in recording findings and progress of a given case. The following exercises have been found to be efficient when the child is old enough, namely, tip-toe exercises, walking in the bare feet, walking on the fore part of the foot, grasping exercises with the toes, and bicycling. W. H. D.

CODA, M.: ETIOLOGY AND PATHOGENESIS OF SPASMOPHILIA (La Pediatria, August 15, 1922, p. 764).

Coda believes that the glands of internal secretion play an important part in the pathogenesis of spasmophilia. These glands may act either directly on the vegetative nervous system, on the neuro-muscular mechanism, on the changes in the calcium in the muscles or even simultaneously by all these means.

W. H. D.

TURNER, A. JEFFERIES: CONVULSIONS IN CHILDHOOD (Medical Journal of Australia, August 19, 1922, p. 203).

Turner advises cold or tepid hydrotherapy if there is pyrexia, and administration of chloroform to arrest the spasms. Then the bowel is emptied by a large enema, a nasal catheter is passed into the stomach and a fairly large dose of chloral is given, 5 grains to a child over one year and 10 grains to a child over two. This is much better than the rectal administration of chloral and bromide. If this does not stop the attack, the prognosis is grave and here morphine hypodermically may be of service. The dose should be small, and repeated if necessary. To a child of 18 months, a 32nd of a grain may be given, to a child of 2½ years a 24th of a grain. In an obstinate case, a lumbar puncture should be done. Repeated attacks of convulsions should arouse the suspicion of epilepsy, unless each attack be preceded by fever or accompanied by digestive derangement. W. H. D.

SCHLOSS, OSCAR M.: TREATMENT OF DEHYDRATION IN INFANTS (Boston Medical and Surgical Journal, September 21, 1922, p. 427).

The treatment applied to cases of severe dehydration is as follows: the patient is given a subcutaneous or intraperitoneal injection of Ringer's solution or saline and within an hour an intravenous injection of 10 per cent. glucose solution. The amount of isotonic saline, or Ringer's solution, varies with the size of the infant; the usual amounts by subcutaneous injection varying from 80 to 300 c.c. and by intraperitoneal injection, from 125 to 400 c.c. Twenty c.c. of a 10 per cent. glucose solution per kilo body weight is the rule, and it is important that it be given within a short time after the saline, and it should be absolutely clear, as even a small precipitate may produce serious reactions. The treatment outlined may be repeated in 5 or 6 hours, if necessary.

W. H. D.

ROBINSON, F. H.: THE PREVENTION OF OCULAR DEFECTS IN SCHOOL CHILDREN (Medical Journal of South Africa, July, 1922, p. 250).

Robinson believes that many of the ocular defects of children are due to their too early entrance upon school life. From 4 to 7 years, the child's eyes are in a primitive or formative state, and during this period the child although naturally hypermetropic, has a very high range of accommodation, which, if abused, will cause increased blood supply and congestion. The height of desks and seats should be supervised, the child should not be allowed to get his work too near to his eyes, the light should be made to shine over the left shoulder. Lastly, the school books and other reading matter for the young child should be clearly printed, well spaced, with type not less than "12 point" printer's scale. The writer believes that by following out these simple principles alone, after a few years there would be noticed in the upper classes a great lessening of squint, blepharitis, corneal opacities, astigmatism, myopia and headache, together with an improved general health.

W. H. D.

GITTINGS, J. CLAXTON AND DONNELLY, J. D.: AN ANALYSIS OF THE CAUSE OF FEVER IN EARLY LIFE WITH A VIEW TO DIAGNOSIS (Pennsylvania Medical Journal, September, 1922, p. 842).

The histories of 734 cases have been abstracted with the result that it was found that respiratory tract infections and acute intestinal disorders comprised 59.6 per cent. of the more serious forms of febrile disease. If there be added meningitis, otitis, pyelitis, heart and skin disease, it is found that over 87 per cent. of all febrile cases were comparatively easy to diagnose by ordinary careful clinical examination, with a minimum of aid from the laboratory. Important factors in making a diagnosis are stripping of the child, careful history of both past illness and the development or persistence of symptoms. Examination of the chest should be made with the child standing, sitting, or lying flat, either prone or supine. Lying on one side produces such radical pressure signs that the interpretation of physical signs may be faulty. Persistent fever in acute gastrointestinal diseases with diarrhea usually means that we are dealing with the infectious type, though the initial temperature of "functional" or fermentative diarrhea is often high and alarming. Two other invaluable procedures are examination of the ear drums and of the urine. If a drop or two of urine be examined without centrifuging, and more than 10 cells be found in a high power field, pyelitis is strongly suggested. Finally, no diagnosis is really complete in a febrile case without a general urinary examination and a blood count, with a differential count where there is leucocytosis. The blood count may be omitted where the diagnosis is clear.

W. H. D.

PLACE, EDWIN H.: TONSILLECTOMY IN THE CONTAGIOUS DISEASES (Boston Medical and Surgical Journal, September 21, 1922, p. 434).

Place reports tonsillectomy in 122 cases of scarlet fever, and in 79 cases of diphtheria, diphtheria carriers, septic sore throat, tonsillitis and chorea. Thirty-nine diphtheria carriers were operated upon, of which 92.3 per cent. were cured within 4 weeks. The conclusions are that tonsillectomy and adenoidectomy are valuable means of shortening the contagiousness of scarlet fever and diphtheria in suitable cases. There is reason to believe that early operation in scarlet fever tends to reduce the danger of complications. Operative dangers are not great and hemorrhage is not more marked than in other conditions; local infection is less common than usually occurs in non-operative cases. Bronchopneumonia occurred 3 times in 196 cases, once being after measles, but in no case did symptoms appear earlier than 10 days after operation.

W. H. D.

HAWES, JOHN B., 2ND.: JUVENILE TUBERCULOSIS (American Review of Tuberculosis, September 1922, p. 606).

Hawes divides children with tuberculosis into 3 groups, as follows: 1. Those who have a tuberculous infection without symptoms or physical signs. 2. Those who have actual tuberculosis of the lung itself. 3. Those with bronchial node tuberculosis, causing both signs and symptoms. The last group is the only one considered in this article, and for the diagnosis of bronchial lymph gland tuberculosis the writer has prepared 5 points of value. The first is a positive skin test unless the child has recently recovered from measles or other acute illness which might cause a negative test, or unless the child has advanced tuberculosis. The second is a definite history of exposure to either human or bovine sources of tuberculosis. The third is constitutional signs or symptoms, particularly loss of weight or failure to gain weight, along with "ease of tire" or undue fatigue, fever or rapid pulse. The fourth is the presence of enlarged bronchial nodes, as shown by x-ray, or by clinical examination of the chest. The fifth point is the absence of other sources of infection or toxemia, such as infected tonsils or adenoids, carious teeth, intestinal disturbances, and particularly a chronic appendicitis, middle ear infection, lymph nodes in the neck, bronchopneumonia, measles or whooping-cough, etc. W. H. D.

MANCINELLI, ROCCO: ETHER TREATMENT OF PERTUSSIS (La Pediatria, September 1, 1922, p. 801).

The writer has had satisfactory results from the subcutaneous injection of ether in whooping-cough in even very small infants. He found marked improvement in 38 out of 61 cases, and in the cases which were not benefited there was usually some complicating condition which might explain the failure. He used injections of 1 c.c. in the first year of life, 1½ c.c. in the second year, and 3 c.c. in the third year. The injections were given every other day and the number given varied from 5 to 10, more often the former than the latter. W. H. D.

MASSI, MARIO: PITUITARY EXTRACT IN DIURESIS IN CHILDHOOD (La Pediatria, September 1, 1922, p. 819).

Massi found that injections of pituitrin in children caused a concentration of the urine more rapidly than in adults. The chlorides increased in proportion to the specific gravity. In nephritic patients the concentration of the urine is slower, the curve of concentration is prolonged, and the return to the original specific gravity is slow, with a diminution of the chlorides.

W. H. D.

JACOBS, FRANCIS B.: DIAGNOSIS AND TREATMENT OF NOCTURNAL AND DIURNAL ENURESIS (Pennsylvania Medical Journal, September, 1922, p. 867).

Jacobs reports results in a series of 49 cases of enuresis treated by hypodermic injections of posterior lobe pituitary extract. One c.c. was given hypodermically once a week for three doses in the girls and for five doses in the boys. Of the 49 cases, 17 were greatly improved, 16 were cured, and in 16 there was no effect. Therefore, 33 of 49 cases were cured or greatly improved by this method of treatment. Masturbation or phimosis seemed to have little bearing on the progress of the cases. The writer thinks that the removal of tonsils and circumcision are of little value; such conditions as cystitis, vulvo-vaginitis, phosphaturia, and highly acid urines, also vesical calculi, undoubtedly cause enuresis and are curable by appropriate treatment. W. H. D.

GERSTENBERGER, H. J., AND DODGE, C. T. J.: THE USE OF RADIANT HEAT-LIGHT IN THE TREATMENT OF OTITIS MEDIA (American Journal of Diseases of Children, October, 1922, p. 320).

Of 14 cases which continued to come for treatment 11 were cured, with not only a cessation of discharge, but also a healing of the drum membrane. The plan of treatment was as follows: 1. Cleansing of the external canal of pus. 2. Exposure of the ear to the light for one hour at a distance of 10 cm., with the use of dark glasses or a towel to protect the eyes. 3. Cleansing of the auditory canal with hydrogen peroxide at home, 3 times a day. 4. Return for exposure to light once daily except Sundays. The value of this measure of therapy is stated as follows: 1. Local and general discomfort are in most cases removed after the first exposure. 2. Virtually all cases show not only a cessation of discharge but also a complete healing of the drum membrane. 3. On an average, 8.7 exposures—from 2 to 14—were sufficient to bring about this result. 4. Without question radiant heat in the form of light is a therapeutic measure of great value which will be found useful not only in the treatment of otitis media in its various forms, but also in other conditions in which the effect of an active hyperemia is desired. W. H. D.

ARCHIVES OF PEDIATRICS

NOVEMBER, 1922

HAROLD RUCKMAN MIXSELL, A.B., M.D., Editor

COLLABORATORS:

Rowland G. Freeman, M.D...New York
W. P. Northrup, M.D........New York
Henry D. Chapin, M.D......New York
Francis Huber, M.D..........New York
Henry Koplik, M.D.........New York
Walter Lester Carr, M.D....New York
C. G. Kerley, M.D...........New York
L. E. La Fétra, M.D.........New York
Royal Storrs Haynes, M.D...New York
Herbert B. Wilcox, M.D.....New York
Charles Herrman, M.D......New York
Wm. Henry Donnelly, M.D...Brooklyn
Frank H. Richardson, M.D....Brooklyn
Edwin E. Graham, M.D.....Philadelphia
J. P. Crozer Griffith, M.D..Philadelphia
J. C. Gittings, M.D.........Philadelphia
A. Graeme Mitchell, M.D..Philadelphia
Charles A. Fife, M.D.......Philadelphia
H. C. Carpenter, M.D.......Philadelphia
I. A. Abt, M.D................Chicago
William P. Lucas, M.D...San Francisco
R. Langley Porter, M.D...San Francisco
E. C. Fleischner, M.D.....San Francisco
Oscar M. Schloss, M.D..........Boston
Maynard Ladd, M.D.............Boston
Charles Hunter Dunn, M.D.....Boston
Henry I. Bowditch, M.D.........Boston
Richard M. Smith, M.D.........Boston
L. R. De Buys, M.D.......New Orleans
Robert A. Strong, M.D.....New Orleans
John Foote, M.D............Washington
Joseph S. Wall, M.D.......Washington
B. K. Rachford, M.D.........Cincinnati
Henry J. Gerstenberger, M.D..Cleveland
Borden S. Veeder, M.D........St. Louis
Frederick W. Schlutz, M.D.Minneapolis
Julius P. Sedgwick, M.D...Minneapolis
William Weston, Jr., M.D..Columbia, S.C
A. D. Blackader, M.D.........Montreal
Edmund Cautley, M.D..........London
G. A. Sutherland, M.D........London
J. D. Rolleston, M.D...........London
J. W. Ballantyne, M.D.......Edinburgh
James Carmichael, M.D.......Edinburgh
G. A. Wright, M.D.........Manchester

PUBLISHED MONTHLY BY E. B. TREAT & CO., 45 EAST 17TH STREET, NEW YORK.

ORIGINAL COMMUNICATIONS

ACRODYNIA AND ITS PROBABLE CAUSATION.

By A. E. Vipond, M.D.,

Senior Physician to the Montreal Children's Hospital,
Montreal

During the past 5 years many articles have been written on this subject after a silence of nearly 100 years. None of the authors can throw any light as to the etiology of the disease—a disease which stands in a class by itself, and the poor little creatures which develop this obscure trouble are to be pitied as they suffer from much physical pain and very much mental unrest and irritability. The name is derived from the Greek, akron-extremity, and dynia-pain. However, pain in the extremities means little, and the name acrodynia itself explains little, because the symptoms of the disease are many and varied, though mostly of a vasomotor type.

Many writers find it difficult to classify this disease but I think we may readily place it in the nervous system group of diseases. It cannot be confused with any other disease. Of interest however is the question as to whether this disease died a natural death, and after nearly 100 years came to life again to be recognized only about 5 years ago. I am inclined to believe that it has been with us all along but that it has not been recognized until a keen observer like Bilderback came on the field. Since his description came out in print many observers have been looking for cases, and I feel convinced that we have been missing many cases of acrodynia for years. There is no doubt that those of us who are busy with children have come across many cases, but they have not been recognized and they have been treated as cases of malnutrition, tuberculosis, etc.

I have met with 5 cases of acrodynia during the past 3 months which I have recognized as such. I have made a careful study of these cases and have arrived at certain conclusions, which differ somewhat from those which have been arrived at by previous writers on this subject.

The symptoms may be divided into:

(1) Catarrhal, involving the nasal mucous membrane.
(2) Mental and cerebral.
(3) Vasomotor.
(4) General enlargement of all the glands of the body.
(5) Loss of appetite and emaciation.

The onset of the trouble is noticed as a discharge from the nostrils, and I fully believe that this is the point of inoculation. The next sign is an enlargement of all the glands, including the auxiliary, inguinal, etc. In one of my little patients the nodes were visible and very much enlarged. This enlargement of the nodes points to a generalized infection.

We next observe a peculiar condition of the child's extremities. The hands and feet look to be edematous and the skin presents a bluish-red color. The impress of the fingers leaves a white mark and the blood returns very slowly into the depleted area. One would expect to feel a warmer hand than normal but on the contrary it is quite cold. The feet and ankles are cold; the same applies to the hands and wrists, also to the ears and eyelids and tip of the nose. Besides this condition, they suffer from extreme pain when the parts are handled and dread any movement, screaming out very much as an infant does when a scurvy or ricket limb is approached or moved.

This condition of the hands and feet is characteristic of acrodynia and cannot be mistaken for any other disease. It is not an erythema or rash of any kind and cannot be mistaken for pellagra. I have met with hundreds of cases of pellagra, while studying this disease in South Carolina, and I must say that the limb condition here does not even suggest pellagra or any other disease. It is a vasomotor condition with a contracted state of the arterioles and a dilatation of the venules. Cold hands and feet, with a bluish-red color, all point to vasomotor change. There is a speudo-paresis, as might be supposed with the cold condition of the feet and also part of the leg. There is a profuse cold perspiration present. The reflexes are absent or difficult to obtain. The parts are several degrees lower in temperature than the body heat. If the child has been walking previous to being attacked with this disease, he is "taken off his feet" and will not walk again for some months' time. It is a vasomotor neurosis.

We now come to what I would term the mental and cerebral condition. There is marked photophobia, due to great irritation of the optic nerve by the toxemia. The child sleeps with his forehead buried in the pillow, on its stomach or on its hands and knees. The mental condition is peculiar. The little patient, who probably before the onset of this disease has been happy and a normal child, becomes wretched and makes everyone in the house feel in the same condition. It wrinkles up its forehead and is constantly crying and cannot be appeased. It sleeps poorly and while undergoing examination never lets up screaming and whinning; there is no doubt that the little one is suffering greatly. There is nothing peculiar about the motions, and the urinary function is normal. The appetite is lost and there is rapid emaciation. The disease is a vasomotor neurosis which is caused by a toxic condition of the nervous system. There is a peculiar type of mental irritability also caused by this same toxemia.

Both of my little patients were 10 months of age at the onset of the disease and it had lasted about 3 months before I was consulted. The disease runs a period of 4 to 5 months and during this time the child and the parents are most unhappy. Both of my patients were girls.

The etiology of the disease is obscure. Several observers have found organisms in the nasal discharge but nothing which would suggest them to be the cause of acrodynia. I felt convinced, with many observers, that the disease was produced by a microorganism and, as the nasal discharge, urine and feces had all been examined by other observers with negative findings, I did not think it necessary to go over this field of research again. I therefore determined to try what a culture taken from one of the enlarged nodes might bring forth.

I used a steel needle with an all-glass syringe and followed out my usual method of taking a culture from an enlarged node under strict antisepsis. I inserted the needle into a large node, after grasping the node between the thumb and index finger of the left hand and withdrew a drop or two from the gland and inoculated a fresh tube of human blood serum. After about 48 to 60 hours, the water of condensation was slightly opaque, but there was no new growth seen on the blood serum. Under the microscope the water of condensation proved to contain a diplococcus which was gram-positive; in other words a gram-positive diplococcus of slow growth was found on the primary blood serum tube. No growth could be found on the serum but, as previously stated, the growth was on the water of condensation. However, on transplants on human blood serum, a very fine growth could be observed. A vaccine was made of this culture with which I treated both of my little patients.

Before I go further with regard to the results of treatment I will give a short synopsis from my notebook of the condition of these 2 patients when I saw them, neither of whom belonged to what is known as the poorer classes:

B. L., aged 14 months. The trouble began in August, 1921, with a discharge from the nostrils. The child cried constantly, slept poorly, appetite poor and had lost flesh. This little patient had intermittent diarrhea. The mother soon noticed that the hands and feet were red and cold. The conditon on examination was as follows: A thin, miserable-looking, crying child, with a wrinkled face and cranky expression. There was no cardiac or lung trouble although the child had a bad cough and considerable discharge from the nostrils was noticed. It could not look at the light and slept with its forehead buried in the pillow. The appetite was poor and it had lost 4 or 5 pounds since August. On examining the legs and feet the condition is found of a vasomotor constriction of the arterioles and a vasomotor dilatation of the venules; the result being that the feet and ankles present a bluish-red appearance. The feet look to be edematous. The feet and lower legs are very cold and impressions of the fingers are left for quite a time; in fact the condition of the feet and legs looks very much like that found in poliomyelitis. There is no paresis but a pseudo-paresis exists with practically abolished deep reflexes. The child seemed to suffer very severe pains in the limbs while at rest, and these pains were aggravated by any handling of the parts. The hands and wrists are in the same condition; the ear and upper eyelids and the tip of the nose are red and cold, and all of the nodes are enlarged; one tooth is loose.

I placed this child on cod-liver oil and fed her properly, but after 2 or 3 weeks time there was practically no improvement.

In the second case, I found a miserable, cranky, emaciated little girl of 14 months. The trouble began 3 or 4 months previous to my being consulted, with loss of weight and appetite and the mother noticed that the child had a discharge from its nostrils, cried most of the time and slept with her forehead buried in the pillow. The hands, wrists, feet and ankles presented the same bluish-red condition as was noted in the previous case. The parts were cold and left the impress of the fingers. The little patient seemed more contented when the limbs were uncovered. There was a pseudo-paresis and practically an obliteration of the deep reflexes. All of the nodes were enlarged. There was marked photophobia. The child was fed properly and placed upon cod-liver oil with practically no improvement.

This disease appears to attack infants and children up to 2 years of age; older children appear to be immune.

I have described 2 typical cases of acrodynia and will now give the results of my treatment with the diplococcus vaccine. One c.c. of the vaccine contained 500 millions of the diplococci. I treated both the patients at the same time and had the opportunity of watching the results of the treatment simultaneously.

I gave each patient 1 c.c. of the vaccine subcutaneously as a primary dose. The reaction was slight. (I may mention here that children stand a dose of vaccine better than an adult, can take larger doses and have much less reaction, both locally and generally). In 3 days time, both the patients showed a marked improvement. At this period I gave them 1½ c.c. and after 3 days the feet and hands had practically reached their normal condition of color and temperature; the bluish-red appearance had practically disappeared. After 3 doses of the vaccine, one of the patients was practically cured. In the other case the results were splendid; the appetite returned and the child was ravenous. It increased in weight one to two pounds in 2 weeks time and started creeping. Both children now slept well and the wretched mental condition and aspects of suffering disappeared and the little ones began to smile again. I found that the lower extremities recovered much more rapidly than the upper.

THE NEW-BORN CHILD (Jahrbuch für Kinderheilkunde, Berlin. August, 1922). Herzfeld discusses the peculiarities of the newly born in respect to weight, temperature and jaundice. His experiences at Riga have convinced him that if there is any period of asphyxia during the expulsion stage, so that the child swallows the mixed vaginal and amniotic fluids, jaundice almost inevitably follows. Decomposition of the lochia is always noted in cases of this kind, although the woman may not show any other signs of morbidity. The vaginal bacteria are not virulent enough to affect the mother but they induce jaundice when swallowed by the infant; there is almost always slight fever with the jaundice. He treats the infant with jaundice, therefore, with systematic purging and reduces the intake of breast milk, shortening the feedings and allowing only four instead of five. This explanation of icterus neonatorum as a "swallowing jaundice" throws light on the larger proportion of cases among the first-born. It also emphasizes the necessity for clearing out the mouth at once to prevent the swallowing; omitting this, he has had jaundice develop unfailingly. He clears out the mouth by aspiration with a soft catheter, warning against the danger of injuring the mucosa when the mouth is swabbed out with cloth and finger. This does not clear it completely, even at the best. He reiterates in conclusion that the liver is not to blame for icterus neonatorum, and that the more skilful the management of the delivery, the rarer the icterus.—*Journal A. M. A.*

CEREBRAL SPASTIC PARALYSIS, WITH SPECIAL REFERENCES TO LITTLE'S DISEASE*

By Daniel L. Golann, M.D.

Brooklyn

Little's disease, or congenital spastic paraplegia, was first described by Little in a lecture before the London Orthopedic Institute, in 1843; and since then the majority of clinicians designate any spastic cerebral palsy as Little's disease, which, when viewing the many and varied etiological factors, is erroneous.

Cerebral spastic paralysis appears to be a much better term by which to describe this syndrome, manifested by these various causative factors. The latter have been well classified by Grossman into 3 distinct groups: (1) prenatal or antepartem; (2) natal or intrapartem; and (3) postnatal or acquired.

In the first, or prenatal group, the various factors which may bring about this syndrome are: defective development of the cerebral hemispheres as seen in poroncephaly and microcephaly, cortical cysts, encephalitis, meningitis, traumatism during pregnancy leading to hemorrhage, continued ill health of the mother during pregnancy, and syphilis. Although we see many cases of lues of the congenital type, yet the incidence of cerebral palsy is comparatively slight. Even since the advent of the Wassermann reaction, the percentage of positive reactions reported in these cases has been uniformly small, although Findlay and Robertson have recorded 13 positive results in a small series of 33 cases. In view of the latter findings, it is urged that this etiological factor be more deeply investigated. We should therefore, with vigilant eye, seek for hereditary syphilis; and I would say that not only should we search for maternal and paternal lues but also for that of the grandparents, which disease at times may leave parasyphilitic lesions in their children and may be the reasons later for arrested development or deformity in the descendents. As to the causes of poroncephaly, microcephalus, etc. there also various factors may be involved, e. g. hemorrhage due to trauma, thrombosis of the longitudinal sinus and meningoencephalitis, of which the former is the most common. These may produce enough pressure or inflammatory reaction to cause destruction of cortical cells and secondarily, degeneration of the pyramidal tracts.

---

*From the Pediatric Department of the New York Post-Graduate Medical School and Hospital.

In the second or natal group (and it is the conditions following the causes in this group, which has become known particularly among French and German writers as Little's disease), the 2 most prominent factors are intermeningeal and intercerebral hemorrhage, occasioned by prolonged and difficult labor, instrumentation and version. Asphyxia at birth has, since Little's day, been considered a prominent factor. It is the opinion of most writers that long and tedious labor is perhaps a more disastrous factor than instrumentation. Premature birth and precipitate delivery are also regarded as causes. Dr. F. C. Rodda, in statistics gathered from postmortem examinations in his clinic, has shown that in 50 per cent. of infants, who die during labor or during the first few days of life, the cause has been cerebral hemorrhage. In many instances this fact was revealed even in easy labors. At autopsy the blood was found to be only partially coagulated or even fluid. Following investigation of the coagulation time of blood in infants, he found the normal average coagulation time to be 7 minutes, and that there is a prolongation of coagulation and bleeding times from the first to the maximum on the fifth day of life with a return to the average of the first day determination time before the tenth day. It is perhaps significant that this corresponds with the age incidence of hemorrhagic disease and cerebral hemorrhage. Rodda comes to the conclusion that severe trauma results in massive hemorrhage and early death, and that a more frequent cause of cerebral hemorrhage is a mild trauma in addition to hemorrhagic disease of the new-born. This may explain many of the cases of hemorrhage, particularly where the labor has been apparently normal.

In the third group arising after the birth, the causes may be divided into 2 classes; one in which the symptoms arise slowly and insidiously, probably due to an inherent motor neuron defect, as in the case quoted by Taylor, where 2 children of a mother suffering from disseminated sclerosis became paraplegic early in life, and the other, in which the onset is acute with temperature, delirium and convulsions. In the latter, the condition has been attributed by Strümpell to a polioencephalitis. That a small number of cases may be attributed to this condition is true, but acute cerebral palsies have also been seen following measles, scarlet fever, small-pox and even tonsillitis, particularly with a history of convulsions. The same has also occurred after pneumonia and whooping-cough, but in the latter it is questionable whether the palsy is not most often due to a mechanical injury during a spasm rather than the effect of a toxic agent. The same mechanism may be involved in the infectious diseases, but this question is debatable. The hemiplegias are the common sequel of this group.

The pathological lesions are as varied as the causes and even today the problem has not been definitely determined. In the prenatal and acquired groups, the lesions will depend necessarily upon the etiological factor involved. In the natal group, although Little pointed out that the majority of these palsies were due to accidents of birth, associated asphyxia, dystocia, etc., yet it was not until 1885 that Sarah J. McNutt showed that in most cases the paralysis was due to hemorrhage within the cranium. Little at first believed that the cause of paralysis was entirely developmental. McNutt pointed out that the hemorrhage, incident to birth, was likely to be most intense about the Rolandic areas. These hemorrhages are brought about by the overlapping of the bones of the head in moulding as it passes through the bony canal of the pelvis, or to pressure of forceps or to too rapid birth with marked changes of pressure in the circulation of the infant. When the infant is asphyxiated, the circulatory conditions present are favorable for the rupture of the delicate intracranial vessels, a fact upon which Little laid stress. While the majority of the hemorrhages occurring during birth are meningeal, they not infrequently due occur within the brain substance. Some idea of the location of the hemorrhage may be gained from the following figures of Weyhe, who, in an analysis of 959 autopsies in infants, found intracranial hemorrhage in 122. In many cases the hemorrhage occurred in several locations. He found a clot in connection with the dura 80 times; with the arachnoid 56 times; in 35 instances it occurred within the brain substance; and 21 cases showed hemorrhage in the ventricles. Later conditions may show chronic meningoencephalitis, sclerosis, cysts and parietal atrophies.

In describing the symptoms, two classifications have been employed. One, according to the location of the lesion and the other, according to the most prominent symptom present. Thus we have, according to the location of the lesion, monoplegia, hemiplegia, paraplegia and diplegia; and according to the other, 4 types: (1) spastic, (2) athetoid, (3) choreiform and (4) atonic.

Monoplegias, which one might expect on theoretical grounds, are as a matter of fact extremely rare. They are to be explained in almost all instances probably as of spinal or peripheral origin. Hemiplegia occurs as a rule in the postpartum group, although it may follow birth injury (an unusual occurrence). It may follow any of the causes mentioned in the acquired group, commencing with a history of acute illness and convulsions, followed by paralysis. Speech may be lost (if it had already been present), particularly if the left side of the brain is involved, but this may be only temporary. In addition to spasticity and paralysis, the patellar reflex is increased and the Babinski is present. (In infancy the Babinski is not of much value as most infants give this sign.) Later, there appears an atrophy of the muscles involved. The face (if involved) and the leg tend to clear up, but the arm remains as a rule unchanged, at times exhibiting tremor and athetosis.

Paraplegia, an involvement of both lower extremities, results from a lesion situated over the upper portion of both motor areas. In diplegia (an involvement of all the extremities, and in extreme cases of practically the entire muscular system), more or less of the entire motor areas of both cortical hemispheres is involved. In the latter conditions (diplegic and paraplegic), we have the syndrome first known as Little's disease. The onset of symptoms is usually early and gradual, but may be delayed or not noticed until the infant is 6 months or a year or more of age, when the patient appears mentally backward, is unable to sit up, talk or walk. There is noticed a spasticity of the extremities, chiefly of the lower, which may be constant or intermittent, slight or well marked. In some cases, there may be opisthotonus due to spasiticity of the neck muscles. Convulsions may set in. As a rule, the child is small and delicate, nutrition being interfered with. In others the physical development may be good, but usually with some degree of mental impairment. Indeed very few of these cases will show normal mental capacity, although in Little's first cases the mentality was supposed to have been normal. The degree of mental deficiency is variable, from mere backwardness to total idiocy. This does not depend upon the severity of muscular involvement, being often most marked in cases where the extremities are apparently only slightly involved. The gait is clumsy and stiff and owing to the spasm of the adductors of the thigh, the legs are crossed, giving the peculiar and characteristic cross-legged or scissors gait. This may be so great as to prevent walking and not infrequently when lying or standing the legs will be crossed. As a rule, all the reflexes are increased. When a hemorrhage has given rise to increase in spinal fluid pressure, there may be eye ground changes, but never to the extent seen in brain tumor. Blindness from cortical lesions or optic atrophy has been noted. Convergent strabismus and occasionally nystagmus has been seen. There are no sensory disturbances and the electrical response is normal.

In the spastic type, the essential symptoms are the rigidity, muscular weakness and contractures. (The paralysis is not a true one, being in reality a paresis or muscular weakness.) To use Little's phrase, it is noted that the mother can handle the child in her lap "all of a piece". The rigidity overshadows the muscular weakness, being most marked in the lower extremities and least in the muscles of the head. When the latter are involved, there may be difficulty in articulation and deglutition, in addition to occasional opisthotonus and orthotonus; there may be various contractures, often giving rise to peculiar positions, an example of which is the "cramped attitude", where the patient lies curled up, occupying the least possible space.

In the athetoid type, there occurs in the peripheral parts of the limbs (more marked in the upper extremities) slow, irregular, worm-like movements, characterized by extension, hyperextension, and lateral motions, all combined to cause the fingers and thumb to undergo the most complex clutching and spreading movements. Analogous movements may occur in the lower extremities and not infrequently in the face, giving rise occasionally to the most hideous grimaces. The movements may occur spontaneously but are increased on voluntary motion, ceasing as a rule when the patient sleeps. In bilateral athetosis the rigidity may be slight and the reflexes normal.

In some cases of diplegia, there may be short, quick, shock-like movements, affecting the proximal parts of the limbs and rarely the face. This is known as the choreiform type. It simulates the movements of chorea minor, but the history and rarity of the latter in children under 3 years of age serve as points of differentiation.

Occasionally instances occur in which the condition is characterized by a hypotonia instead of a spasticity. The hypotonia allows the limbs to be placed in almost any abnormal position. The reflexes are present or increased and the electrical reaction is normal, thereby differing from amyotonia congenita (Oppenheim's disease) with which this type may be confused.

The diagnosis of cerebral spastic paralysis in children should offer no difficulties. The history, together with the various forms of paralysis, the spasticity, gait, greater or less degree of mental deficiency, the increase of deep reflexes, the absence of any appreciable degree of atrophy and the normal electrical reactions makes the diagnosis simple and serves to rule out conditions arising from acute spinal affections. It may be necessary at times to exclude such conditions as simple delayed walking, rickets, hypothyroidism and idiocy as causes of an apparent rather than a real paraplegia. It is obvious that any of these cannot be the sole diagnosis when there is a history of one of the etiological factors together with increased reflexes and spasticity. Spina bifida occulta may sometimes give rise to confusion, but in this condition there will be usually found a hairy or pigmented mole over the lower lumbar vertebra and careful palpation will either confirm or rule out its presence. In the spinal spastic paraplegias of the familial type the age of onset, the course and the hereditary or familial element will serve as a means of differentiation. Spinal syphilis may be detected by the history of onset, the course of the disease, other signs of lues and the blood and spinal Wassermann reactions.

The prognosis is variable, depending to a great extent upon the etiological factor present, and the nature of the morbid lesion. It is generally admitted that cases of true Little's disease, i. e., those cases of paraplegia or diplegia, due to developmental defect or to injuries received at or before birth, present a fairly good outlook, both as to mentality and paralysis. According to Sharpe, most cases due to hemorrhage grow progressively worse while those due to developmental defect show a tendency to improvement. The hemiplegic type offers the best prognosis as to mentality, but the chief trouble in this type is the tendency to permanent contracture of the hand and forearm. In the paraplegic or diplegic type, the patient may eventually learn to walk if the mentality is not markedly impaired and if the lesion is not too severe. However complete recovery is not to be expected. A great many of the latter types, due to malnutrition, die of some intercurrent infection during the first few years of life. It is not uncommon to find a great many cases of iodicy and epilepsy among these patients. Sachs, in an analysis of 275 cases, found idiocy in 35 per cent. of diplegic, 60 per cent. of paraplegic and 13 per cent. of the hemiplegic type. Still states epilepsy develops in a large number of cases while in Gowers' cases 66 per cent. developed epilepsy. With the experience of the past 2 decades, improvements may be expected in a fair percentage of cases, receiving early and proper treatment.

If a new-born infant exhibits drowsiness or convulsions, it may be assumed that it had sustained an injury during labor. Absolute rest is required and an ice bag to the nape of the neck or the head may be applied. If the child is unable to nurse, it should be carefully fed with a Breck feeder or a spoon, using mother's milk if obtainable. If there are convulsions, small doses of bromides or chloral by rectum should be given. If convulsions persist, chloroform inhalations may be practiced no matter how young the infant, provided caution is employed. The blood coagulation and bleeding times should be taken and if they are prolonged, injection and transfusion of blood should be practiced. If these measures fail, craniotomy should be resorted to, if there are positive signs of intracranial hemorrhage. Cushing has performed several successful operations and Strachauer also directs attention to this neglected form of treatment. If the hemorrhage is at the base of the skull lumbar puncture may be performed in addition to the remedies aforementioned. This treatment, if successful, may not only save life but also prevent the severe after-effects on the nervous system.

In other cases, however, where the condition is not noticeable or has not been detected until the end of the first year or perhaps late, the physician is called upon to prescribe treatment for the spasticity, deformity, mentality, etc. At first, repose and passive corrective exercises are recommended by Creada Aguilar.

He protests against rubbing, massaging, electricity and muscle training in the early stages, because he believes that Little's disease is a hyperactivity of some portions of the motor tract; hence the elimination of everything that is stimulating. After some improvement has taken place with the corrective exercises, slowly massaging, electricity and muscle training may be instituted with hot baths at a temperature of 100° to 108°. He denounces any attempt at surgery. Nevertheless, where deformity is existent and a thorough trial of the non-surgical measures has been given, in order to improve the patient's chances for locomotion, it is often necessary to perform muscle and tendon operations; nerve operations are at times performed, such as the partial excision of the nerve supply to the strong and contracted muscles (Stoeffel operation), and the section of the posterior nerve roots (Foerster operation). These operations are advised by some and denounced by others, but in skilful hands, where there is an indication and no contra-indication, they should be employed.

Clarke has recently reported good results in the treatment of these conditions, particularly in the developmental types, by the use of internal glandular products. In my cases the use of mixed gland products has not produced any definite results. Cases that present evidence of syphilis should receive specific treatment. Even in cases where the history and the Wassermann are negative, the mixed treatment should be tried. If it does no good, it will at least do no harm. Epilepsy, if it develops, should be treated accordingly.

Case 1. R. B., female, age 4, first seen March 3, 1922. The chief complaint was inability to walk. The family history is negative; 2 other children in the family, both normal, no miscarriages. The child was born full term and labor was induced by catheter and packing, lasting about 18 hours. No instrumentation. The mother gives a history of a fall during the eighth month of pregnancy. At birth, weight was 10 pounds. Cyanosis was present for one hour after birth. Nothing abnormal was noticed except a left internal strabismus until the child was one year of age, when in trying to make the child stand a stiffness of the legs was noticed. Mentality and nutrition were normal since birth. The personal history reveals that the child sat up at 5 months, the first teeth erupted at 6 months, and she commenced to talk at 15 months. She was given the breast during the first year. At 2 years she had measles and at three, whooping-cough. Physical examination showed an obese child, weight 50 pounds, and height 39½ inches. The circumference of the head measured 21 inches, chest 26 inches, and abdomen 28 inches. The head was negative except for the internal strabismus of the left eye and 3 carious teeth. Examination of the chest and abdomen revealed nothing abnormal. The upper extremities were normal. The lower were spastic and there was slight equino-varus of both feet. The knee reflex was increased, otherwise the reflexes were normal. The mentality was good. On standing and particularly on walking the legs were crossed, exhibiting a typical scissors gait. The blood Wassermann was negative. Massage, muscle training, and hot baths were instituted with marked improvement.

Case 2. R. B., female, age 27 months, first seen June 19, 1922. Chief complaints, inability to talk or walk. Family history negative except one miscarriage after birth of patient. Two previous children normal. Mother gives a history of a fall during sixth month of pregnancy. Personal history reveals that the patient was born at term, normal labor lasting two hours, no asphyxia and no convulsions. The infant, however, was drowsy the first 3 days after birth. The birth weight was 5 pounds, sat alone at 2 years, first teeth at 9 months. Whooping-cough at 14 months. Breast fed the first year. Examination showed a small fairly well nourished child, weighing 25 pounds with a head circumference of 19 inches. The head was negative, with the exception that the teeth (incisors) were in poor condition and notched. The thorax exhibited a slight rosary. Heart and lungs, normal; abdomen, normal. The extremities showed a slight epiphyseal enlargement. There was no spasticity or flaccidity of muscles when the child was at rest, but on attempting to walk the cross-legged progression was noted with steppage. The deep reflexes were increased. Ankle clonus was absent. The mentality was slightly retarded. A negative blood Wassermann was obtained.

BIBLIOGRAPHY.

1. Little: Lancet, 1, 350 (1843).
2. Findlay, L. and Robertson, M. E.: Glasgow Med. Jour., LXXXII, 401 (1914).
3. Rodda, F. C.: Jour. A. M. A., Aug. 14, 1920.
4. Taylor, J.: Allbutt and Rolleston Syst. of Med., 1911, VIII, 452.

5. McNutt, Sarah J.: Amer. Jour. Med. Sc., CLXXVII, 58 (1885).
6. Weyhe, Osler and McCrae: Syst. of Med., 2nd Ed., V, 412.
7. Sharpe: Diagnosis and Treatment of Brain Injuries, 1920.
8. Sachs: Nervous Diseases of Childhood, 1905, p. 445.
9. Still, G. F.: Common Disorders of Childhood. 3rd Ed., 1920, p. 709.
10. Gowers: Nervous Diseases of Childhood, 1905, p. 843.
11. Cushing, H.: Amer. Jour. Med Sc., CXXX, 563 (1905).
12. Strachauer: Minnesota Med., Dec. 1920.
13. Aguilar, C.: Jour. A. M. A., Feb. 12, 1921, 76:484.
14. Stoeffel: Jour. A. M. A., December 30, 1911, p. 2167.
15. Foerster: Jour. A. M. A., July 12, 1913, p. 147.
16. Clarke: Ga. State Med. Jour., Feb. 1921.

FALSE INCONTINENCE OF THE SPHINCTERS IN CHILDREN (Paris Medical, July 22, 1922). Morichau-Beauchant describes a number of cases, out of a much larger experience, with what he calls paragenital auto-erotism. The children hold back their urine or their stools on account of a pleasurable sensation from the excitation of the mucous membrane in the anus and bladder or urethra. This voluntary holding back is finally overcome by the imperious demands of nature, and the child's garments are soiled. The children are not degenerates, and this pseudo-incontinence is merely a survival of the auto-erotism of the infant. He adds that by watching monkeys we can appreciate the heavy load of coprophile and auto-erotic heredity with which we are burdened. The weakening of the sexual instinct and the return to auto-erotism explains some of the phenomena observed in the senile. The children may be partially unaware of their voluntary repression of their impulses. The physician must explain kindly to the child that he does it on purpose, and show him how the yielding to this pleasurable sensation is reprehensible and degrades him in his own eyes and disgraces him before others. The parents are usually harder to manage than the children; they are either so prudish that they refuse to believe the physician's explanation, or they judge the child as if he were an adult and the prey of the worst perverted instincts. The parents have to be impressed with the fact that a bad habit is not corrected by punishment, and that only gentle means should be employed. "Parents who cannot comprehend this are preparing sad tomorrows for themselves." The paragenital auto-erotism generally disappears of itself in time, but these children require special supervision as this tendency may return in a graver form later unless warded off by wise training. —*Journal A. M. A.*

A GROUP OF DIFFICULT FEEDING CASES FROM THE PEDIATRIC DIVISION, CITY HOSPITAL.*

By Walter Lester Carr, M.D.

New York

In every hospital that cares for infants under the age of one year there are babies of low vitality who are admitted as feeding cases with diagnoses of marasmus, athrepsia, and malnutrition. Although these entrance diagnoses are subject to revision after a physical examination, the fact remains that many of these babies have no history of a primary condition that justifies the use, from a diagnostic standpoint, of any of the above terms. This is apparent to everyone seeing infants in what is commonly known as a "feeding ward" and it has lead the physicians of the Pediatric Division of the City Hospital to discard these titles, except the one of malnutrition which is used as descriptive of low nutrition from many different causes, e. g. congenital syphilis.

A record of antecedent history in a baby brought from a tenement house or from an asylum may be so meager as to give no details of its previous nutrition except that it has had bottle feeding. Even the age has to be approximated and the birth weight is not known. An infant admitted with this indefinite history is to be fed in a scientific way that will cause it to develop and grow along the standards of normal babies of a relative age.

Unfortunately, this feeding cannot conform always to an accepted formula and such a baby starts with a handicap that it is difficult to overcome, as it may have had many varieties of food that cannot be figured in any table of calories. Not only has the food been of uncertain value, but many of the babies have had infections of the digestive tract and also of the nose, throat and bronchi which have lowered their resistance, metabolism, rate of growth, and in some instances have lead to structural changes which are found in a routine physical examination. Particular interest attaches to a group of cases with pathological processes in the lungs that are verified by the x-ray. Some of these babies cough but many of them do not give this symptom and there may be nothing in temperature or respiration to indicate a pulmonary disease. The respiration may be increased without a temperature above normal. Even when the physical findings show areas of consolidation, especially at the roots of the lungs, there is no clinical history of bronchitis or pneumonia. The temperature range, determined by observations on many babies while in the hospital, will not be more than 1° to 1½° with an occasional rise which an examination will not disclose as associated with any new process. The physical examination of the chest is made with especial attention to the interscapular spaces, as dulness may be evident without râles or consolidated areas in the lung tissue. The record of physical findings is entered on the history chart before a patient is referred to the x-ray room and the entry of the roentgenologist is then checked up with the physical history—not the reverse.

---

*Read before the Section on Pediatrics, New York Academy of Medicine, April 13, 1922.

Much importance attaches to these babies not only in connection with methods of feeding but also as to the question of present or latent tuberculous infection. After careful observation of their records it is learned that while the babies require a high caloric intake, as much as 80 to 90 to a pound, the delay in metabolism prevents a full digestion of the fat content of cow's milk. It is observed that they do better on a high proteid than on a high butter fat which has to be replaced by some other fat, preferably cod-liver oil. Butter milk and preparations such as eiweissmilch have an important place in feeding. In every instance the gain in weight is slow and great care is essential lest the food be crowded both in quantity and percentages. Malt sugars are of value and are better than milk sugar in increasing nutrition and adding weight. Babies of extremely low vitality may improve with cane sugar in their milk formulae but this cannot always be depended upon nor kept up for a long time. Marriott mentioned recently, in his address before the Philadelphia Pediatric Society (ARCHIVES OF PEDIATRICS, January, 1922), the fact that athreptic infants may have stationary weights for a long time despite a fairly large intake of food. Because of the deficient oxygenation caused by impaired lung capacity they require treatment of the nasopharynx and a maximum of out-of-door air and sunshine. As the question of tuberculosis cannot, in many infants, be determined by the von Pirquet reaction these patients must be regarded with suspicion and tentatively recorded as pre-tuberculous.

Routine feeding in the City Hospital is based on the employment of Walker Gordon Milk containing 4 per cent. butter fat, a free use of cod-liver oil and the administration of orange and tomato juices. All histories have the feeding formulae marked in percentages of fats, sugars and proteids and if a change is made, as to skimmed milk or butter milk, the percentages and calories are computed with the change. For many of the babies the charts designed by Dr. Moffett are used so as to render in a graphic way the ingredients in the formulae and make them conspicuous as it is interesting to visualize the food values by the different colors.

The uncertain condition of the gastroenteric tract is shown by the stools which often contain mucus and undigested milk—especially fat. It is noticeable that in many babies the stools are well digested and of excessive bulk.

The following summary of a few histories will show, in brief, the type of babies mentioned:

History 2889. Female, 5 months old. Impaired resonance between scapulae. Confirmed by x-ray, "tuberculosis both hili". Von Pirquet negative. The temperature range was 96° to 99° (rectal). There was no gain in weight for 3 months. Weight on discharge after 5 months and 20 days was 9 pounds 4 ounces. Average calories 60.

History 25090. Male, age not known. Weight 7 pounds 5½ ounces. Dulness with changes in both apices, confirmed by x-ray. Von Pirquet negative. Temperature 96° to 99° (rectal). Weight after 5 months, 8 pounds 7 ounces. Diet largely skimmed milk—average calories 70.

History 28898. Male, age about 2 months. Baby rachitic. Von Pirquet negative. Changes in lungs on physical examination, early tuberculosis, and shown x-ray plate. Weight on admission 8 pounds 10 ounces. Best weight 9 pounds 5 ounces but was discharged with a weight of 8 pounds 15 ounces when 5½ months old. This baby could not assimilate more than 50 calories per pound of weight. Temperature 97° to 99° (rectal).

History 468. Female, 6 months; weight 6 pounds 13½ ounces. Changes in upper right lung, shown in x-ray plate. Von Pirquet negative. Best weight 9 pounds 9 ounces. No gain for 2 months but a gradual gain for 2½ months. Calories averaged over 65 to a pound with gain after 74 to a pound. Temperature was subnormal and slightly above normal until the baby contracted measles, complicated with otitis and pneumonia, which caused her death.

History 587. Male, admitted at 4 months. Weight 6 pounds 13½ ounces. Right lung, upper lobe, changes found on physical examination shown in x-ray plate. Von Pirquet negative. The best weight was 8 pounds 2 ounces. Baby was sent home after measles and bronchopneumonia with a weight of 7 pounds and 12 ounces. For this patient the calories were not so high but were up to 61 per pound at the time of discharge. Temperature range until measles, 96° to 99°.

History 1311. Male, admitted at 6 months. Weight 10 pounds 4 ounces. Von Pirquet negative. Best weight 13 pounds 2 ounces. The first 2 months the weight varied between 10 and 11 pounds. Great interest attaches to this child because of repeated attacks (10) of bronchopneumonia. There was also otitis. The calories of the formulae were as high as 65 per pound but were lower during the attacks of pneumonia. Child died.

In presenting some notes on a few of this group of babies who were slow in gaining weight it is not intended to convey the impression that they were feeding cases simply but it is desired that attention should be given to the following facts, which, although previously stated, are repeated to emphasize their importance:

Many babies admitted to a hospital to be fed, and described as nutritional cases, are suffering from the results of bad feeding and also from respiratory infections. Although a physical examination does not disclose an active process in the lungs, there are changes in the bronchial lymph nodes, and bronchial membrane. Such changes lessen pulmonary expansion, interfere with oxygenation and impair digestive activity and metabolism. This lowering of vitality shows in the subnormal temperature of the babies and in their inability to digest formulae suitable for their ages and weights with a resultant slowness of growth.

The fat of cows' milk is difficult to assimilate and has to be replaced by cod-liver oil or emulsified fat.

Proteid digestion may require assistance by peptonization, the use of butter milk or a protein milk and frequent readjustment is necessary.

Milk sugar has to be replaced by malt sugar and malt soup and in babies with subnormal temperature by cane sugar.

Whatever food is given the caloric intake will be high.

Fresh food, other than milk, is needed to aid nutrition. Carbohydrates, vegetables and fruit juices are of value.

These babies should be supervised as to clothing, fresh air and sunshine and for those whose von Pirquet reactions are negative the safest course is to care for them as potentially tuberculous rather than as feeding cases. So soon as they can be dismissed from the hospital the babies should be sent to country homes and away from hospital environment.

SPASMOPHILIA (Jahrbuch für Kinderheilkunde, Berlin, 1921, 94, No. 3). Bossert and Gralka would restrict the term spasmophilia to children with overexcitable nervous system from constitutional causes. This type of true spasmophilia may be influenced by dieting. There is also an overexcitability left by infectious diseases. In a third group the cause of the overexcitability is still a mystery. The response of the muscles to electric tests confirms this classification. Abnormal parathyroid functioning modifies calcium metabolism, and this may entail a tendency to edema, the subcutaneous tissues imbibing water; also to carpopedal spasm from the musculature sharing in this imhibition. In contrast to the tetany group, is the group in which laryngospasm is the cardinal symptom; there is usually extreme hyperexcitability of the nerves while the muscle responses are like those in normal children. These children have been fed with cow's milk. The calcium deficiency in this group seems to be felt most in the brain. Quest noted in child cadavers with exceptionally low calcium content of the brain, that the children had all died from convulsions. The prognosis depends on the special organ involved. In rachitis it is the bones that suffer most from the deficiency of calcium; in tetany, the muscles; with laryngospasm, the nervous system, and with convulsions, the brain. These various types may be amenable to dietetic and medical measures, the overexcitability subsiding with the other symptoms. Myographic curves of each type are reproduced.—*Journal A. M. A.*

THE DIAGNOSIS OF PERITONITIS AND PERITONEAL TRANSUDATES BY MEANS OF ABDOMINAL PUNCTURE WITH CAPILLARY TUBE.*

By Bernard S. Denzer, M.D.

New York

The difficulties surrounding the diagnosis of peritonitis in infants have been universally recognized. The signs of peritonitis, so striking in the adult, are vague and misleading in the infant; pain, localized distention and paralytic ileus are either absent or difficult to elicit and, even when present, may be ascribed to some gastrointestinal disturbance of which they are also characteristic. Finally, the fact that peritonitis in infancy occurs so often without an intraabdominal focus, is part of a general infection or is of the so-called primary type, renders its diagnosis particularly uncertain. Standard texts and special studies on peritonitis have emphasized these difficulties. Last year Downes, in analyzing the deaths following operations for pyloric stenosis, wrote that only an autopsy could exclude a complicating peritonitis as the cause of death. This is quoted to indicate how difficult Downes finds it to establish a diagnosis of peritonitis in these young infants.

The perfection of the usual methods of clinical examination of the abdomen hold out little hope of more accurate diagnosis and the effort was therefore made to find some objective or instrumental procedure that would demonstrate minute amounts of peritoneal fluid. The technic for obtaining samples of peritoneal fluid from laboratory animals by inserting a capillary tube into the abdominal cavity suggested the procedure finally adopted. A metal trocar canula was made, ½ inch long and about 17 gauge bore. Glass tubing was drawn out, inserted through the shaft of the canula and cut off so as to protrude 1 or 2 mm. from the tip of the canula. The purpose of this technic is to prevent the breaking of the capillary tube within the peritoneal cavity. The capillary tubing impinges on the wall of the canula. After the tubing is safely inserted into the canula, a break, if it occurs at all, will take place at or above this point, and the lower fragment fixed in the shaft can be withdrawn with the canula.

---

*Read before the New York Academy of Medicine, Section on Pediatrics, November 17, 1921. For discussion see Archives of Pediatrics, March, 1922, page 186. From the Pediatric Service, New York Nursery and Child's Hospital.

The performance of the puncture is simple. The trocar canula is inserted through the abdominal wall and the sudden release of pressure indicates that the peritoneal cavity has been entered. The trocar is removed and the capillary tube is inserted as far as it will go. It is advisable to wait for a few moments, and to turn the needle in various directions before concluding that there is no fluid. Possibly a bit of omentum or the wall of the intestine may temporarily block the capillary tube; or when there is only a small amount of fluid this momentary wait and the straining and crying of the infant may aid in distributing it over the peritoneal cavity. At any rate, the sight of the gradually rising column of fluid has frequently rewarded this precaution. Any place on the abdomen except the parts covering a solid viscus or one attached by a short mesentery may be used. In the early part of the work needles made entirely of glass were used. Including the cases examined by this earlier method over a hundred taps have been done and no untoward incident has occurred.

The question naturally arises as to whether fluid can be obtained by the capillary tube only when there is a large ascites or whether this method can demonstrate minute amounts, and it would be advisable to consider this question before reviewing the results in peritonitis. The report of one experience of Dr. Anderson and myself will suffice. Baby H. R., an ill-nourished infant of 10 weeks, was tapped in the left lower quadrant, 4½ c.m. from the midline, and no fluid was obtained. Five c.c. of Ringer's solution was injected through the needle which was then withdrawn. Seven minutes later the abdomen was tapped just below the umbilicus and clear fluid was found. The intraperitoneal injection of saline which was indicated in this case was then completed. When one considers the size of the peritoneal cavity and particularly the surface afforded by the coils of intestine for the distribution of a small quantity of fluid, 5 c.c. of Ringer's solution seems to be a very small amount. Nevertheless, the presence of this fluid was demonstrated almost 2 inches from the site of injection.

In 6 cases of peritonitis this procedure was used in establishing a diagnosis. Only those cases will be referred to that illustrate some interesting phase of the subject. Baby L., a colored infant, 2 months of age, and weighing 6 pounds and 6 ounces, was a foundling and its medical history was incomplete. At the first examination Dr. Anderson, the resident physician, made the following note: "The baby presents the usual picture of the true marantic infant; worn, anxious expression, emaciated body and dry inelastic skin." Marasmus with the possibility of luetic infection was the diagnosis considered. Abdominal puncture was performed and a white milky fluid rose in the tube. This showed on smear gram-positive cocci in chains. The baby died the day following laparotomy, and autopsy revealed a diffuse purulent peritonitis. No focus of infection or portal of entry could be found and the case must be classified as one of the idiopathic types.

This case is particularly interesting because there were no signs of peritonitis. An abdominal tap was done merely because this procedure had been adopted in all acutely ill cases where the diagnosis was in doubt. Baby L. typifies peritonitis in early infancy. Such infants show the signs of marasmus only, and there is nothing either in the history or examination to direct attention to the abdomen. There are no adequate grounds for suspecting peritonitis, and even if this condition were suspected the usual methods of examination would not give the surgeon sufficient support to proceed to operation with conviction and faith in his diagnosis. At the same time the possibility of peritonitis could not be excluded. Under these circumstances a procedure that reveals the presence of an exudate or gives assurance of its absence may be very helpful.

Two other cases illustrate the initial reaction of the peritoneum to inflammation, and that abdominal puncture demonstrates an extremely small amount of fluid. Baby Francis R. was admitted to the hospital because of vomiting, refusal of food, and an infected umbilicus. The umbilicus was red and a drop of pus could be expressed, and the infected navel was thought to be the origin of the peritonitis. Abdominal puncture was done and only the smallest drop of pus obtained. The smear was filled with pus cells and a few organisms were found. The appearance of the peritoneal cavity at operation was interesting. The peritoneum was thick and indurated; the coils of intestine were red and injected and covered with a loose edematous fibrin; but there was no real free fluid. The presence of the exudate was nevertheless demonstrated by the capillary tube.

The final case presented a similar picture. A colored infant, 6 weeks of age, developed within a few hours marked prostration and distention; and a congenital inguinal hernia was found to be irreducible. Dr. Sammis felt that it was suffering from a strangulated inguinal hernia with possibly a complicating peritonitis. With the capillary tube only a few drops could be obtained; only enough for a few smears. The fluid was a thick mucoid material. It contained very few pus cells and occasional gram-positive cocci in pairs. The patient was operated upon. The diagnosis of strangulated hernia and early peritonitis was confirmed at autopsy. Doctor Astrow, who assisted at the operation, told me that there was no free fluid, and at the autopsy the coils of intestine were moist and edematous and a few flakes of fibrin were found. The peritonitis was evidently in its earliest stages, before the development of the typical brownish yellow exudate so often seen at the operating table.

Briefly, then, the use of the capillary tube in peritonitis discloses extremely small amounts of exudate. The therapy of peritonitis in these young and delicate infants will probably remain far from satisfactory; however, adequate therapy depends upon prompt recognition of the disease and the procedure described raises the hope of early diagnosis.

In 2 other conditions, marasmus and rickets, abdominal puncture developed unexpected results. Twelve marantic infants were tapped and in 7 of them ascites was demonstrated. As a rule the fluid was clear and at most contained 1,700 cells. The cellular elements were chiefly lymphocytic. There is every reason to believe that the amount of fluid is small, and speculation as to the rôle that this ascites plays in the picture of marasmus would take us too far afield. For the moment we must content ourselves with recording the fact that in a certain percentage of marantic infants free fluid may be found in the peritoneal cavity.

In 5 of 12 cases of rickets, a fluid was demonstrated similar in appearance and cellular content to that found in marasmus. Here, too, the ascites is probably small. The occurrence of potbelly in most of the cases that showed free fluid suggests that the mechanical and circulatory derangements, incident to the large abdomen, are probably responsible for the ascites. However, this is merely an impression and would need confirmation.

Before closing I wish to refer to some work of Dr. Anderson and myself on the absorption of fluid injected into the peritoneal cavity. For the present the results of the investigation do not interest us. The striking thing is that we can now follow with ease, safety and accuracy the response of the peritoneum to a foreign substance. The study of one case will illustrate what I mean. Baby Wm. W. was a malnourished, somewhat dehydrated, infant 3 weeks of age and an intraperitoneal injection was indicated. The preliminary tap before the injection of saline was dry. Then 150 c.c. of Ringer's solution was injected. The abdomen was tapped 3, 6, 12, and 24 hours after the injection. At the first tap the fluid was sticky, thick and mucoid, very much like that in the early case of peritonitis just described. In some of the smears in similar cases, made within 6 hours of the injection, Dr. Anderson found large endothelial cells with amoeboid movement, probably the macrophages of Metchnikoff, which Adami considers characteristic of the early inflammatory reaction. In this way the course of this sterile chemical inflammation was traced just as one follows, by serial blood counts, the reaction of the blood to infection.

			Post-Injection Taps			
	Preliminary Tap	Amount Injected	3 hours	6 hours	12 hours	24 hours
Wm. W. 3 weeks	0=Dry	150 c.c. Ringer's	Total cell count 600 per c.mm. Differential Polys. 87% Lymphs 13%	Total cell count 6,200 per c.mm. Differential Polys. 92% Lymphs 8%	Total cell count 12,800 per c.mm. Differential not done	0=Dry

This evening I have presented the results of abdominal puncture in a few cases of peritonitis and in 2 diseases in which peritoneal transudates were found. But these results merely illustrate the essential proposition I should like to emphasize. They indicate how a new method reveals new problems or new avenues of approach to older ones. The peritoneal response to injury may now be followed, I believe, with safety and with a degree of faith in the significance of the findings similar to that which we have learned to place in lumbar puncture. To the practical surgeon and to the physician, whether interested in adults or children, such a procedure may hold out the hope of more prompt diagnosis of peritonitis, of detecting tuberculous exudation before it has reached the stage of evident ascites, of the possibility of serotherapy of the peritoneal cavity. To the investigator, the question of the production and the limitation of exudates and the old question of absorption immediately present themselves. Such are the kind of problems that invite attack. Of course, it will be necessary to establish the limitations of this procedure. To arrive at this final evaluation will require the experience of many men and varied material.

PNEUMONIA NEONATORUM (British Medical Journal, March 25, 1922). Among eighty cases of infantile death analyzed by Browne there were twenty-one, or 26.25 per cent., in which the cause of death was found to be pneumonia. Eleven of these occurred in premature and nine in full-time infants, the ages varying from 8 hours to 5 weeks. The very large proportion occurring in premature infants illustrates the increased liability to infection on the part of the premature infant. Five of the infants were syphilitic, another was probably so, while another had fracture of the supraorbital plates with extradural hemorrhage overlying them. One of the syphilitic cases showed an extradural hemorrhage in the spinal cord. In many of the cases, especially among the premature infants, there were atelectatic areas in the lungs, and in some cases these involved part of one lung and a large part of the other. It is, therefore, probable that atelectasis is a predisposing factor in the causation of pneumonia. Pneumonia is sometimes due to antenatal infection from premature rupture of the membranes, and the infant may be not only infected but also suffering from an advanced stage of pneumonia before its birth. "Acute hemorrhagic pneumonia of infants" forms a distinct clinical and pathologic entity which gives rise to sudden death in children who may be apparently previously healthy, either full-time or premature. It follows acute congestion of the lungs, the fragile vessels in the alveolar walls rupturing and flooding the alveoli and bronchi with blood. The sudden death is preceded by epistaxis and blanching of the skin, and the etiologic factor may be organismal or possibly of the nature of an immediate anaphylactic reaction. The importance of avoiding premature rupture of the membranes during labor, and of taking every precaution to safeguard the newly born infant against infection is emphasized.—*Journal A. M. A.*

MONGOLIAN IDIOCY OCCURRING IN ONE OF TWINS.*

By Homer T. Clay, M.D.

Chicago

Mongolian idiocy occurring in twins, one of which is a Mongolian idiot and the other a normal child, is a relatively rare occurrence, and it therefore seems desirable to report the following case.

Report of Case. Emil M., 9½ months old, was admitted to the Children's Memorial Hospital on February 11, 1921, because of loss of weight and diarrhea. He was the seventh child of Polish parents. There were 6 other children living and well. Both father and mother were living and well. The father and mother were both 42 years old at the time of the birth of the twins.

The mother had a normal pregnancy, but a difficult labor. Forceps were not used. The birth-weight of the Mongolian twin was not known, but it was said to have been a full-term infant. It was said to have weighed 9 pounds and 3 ounces at 7 months of age, but at the time of admission to the hospital it weighed only 6 pounds, 9½ ounces. It had always been breast-fed, 5 times daily, with no supplementary feeding. It had no history of previous enteritis, but was brought to the hospital because it continued to lose weight and was becoming too weak to nurse.

On examination the child was observed at a glance to be a Mongolian idiot. Its head was short anteroposteriorly, and the face was flat. The anterior and posterior fontanels were open. There was a scant amount of hair. The eyes were set widely apart, and were typically Mongolian. The tongue protruded from the mouth. There were no teeth. There was a loud blowing systolic murmur over the base of the heart, a condition which is so common in Mongolians. The abdomen was sunken and the consistency of the skin doughy, showing a marked dehydration. The skin hung over the extremities in folds. There was a syndactylism involving the second and third toes on the left foot and the third and fourth toes on the right foot.

The patient remained in the hospital 13 days. During this time it steadily lost weight, had a temperature ranging from normal to 102°, was difficult to feed, developed an acute enteritis and died on February 24, 1921. A necropsy was not obtainable.

---

*From the Children's Memorial Hospital, Chicago.

The normal twin was brought to the dispensary for comparison, where the accompanying photograph was taken. Sam M. weighed 19 pounds, 11⅛ ounces, was a very fat, healthy baby, and no abnormalities were found. He had apparently normal intelligence, could sit alone, and could utter a few monosyllabic words. There was no history of illnesses.

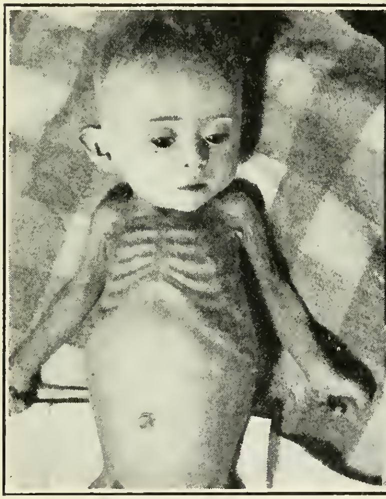


Fig. 1. Mongolian Idiot, Twin of Normal Boy.

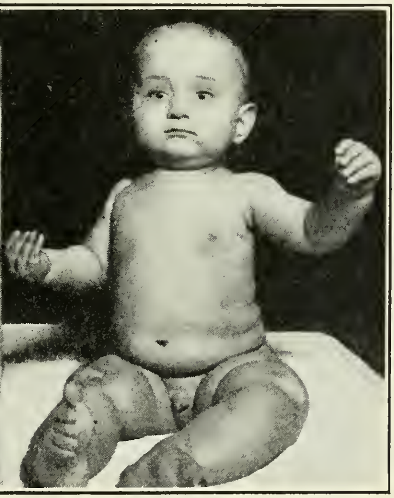


Fig. 2. Normal Boy, Twin of Mongolian Idiot.

The accompanying photographs show the marked contrast between these brothers, both in their nutrition and mental attitude. As so often happens, the photograph does not show the characteristic Mongolian features as plainly as does the living child. There was, however, no doubt in the minds of all the staff that the child was a true Mongolian.

COMMENT.

The etiology of Mongolian idiocy has been much discussed, and there are many theories, no one of which seems tenable. Considerable doubt has been cast upon the widely prevailing theory that the Mongolian idiot is "a sexual exhaustion product." Thursfield's[1] recent review of a number of his cases would lead one to believe that the age of the mother is not the vital factor that it was once thought to be. Syphilis, tuberculosis, the exhaustion product theory, the condition of the mother during pregnancy, the factor of the prevention of conception, the endocrine factor, all have been suggested, proved and again disproved, until one feels that there is nothing tangible. One may hope that further investigation along endocrine lines may offer a rational explanation of this most interesting condition.

The rarity of Mongolism in one of twins is attested by the fact that a search of the literature reveals only 4 cases previously reported; one by Neumann[2], another by Shuttleworth[3], a third by Swanberg and Haynes[4], and a fourth by McLean[5]. Shuttleworth's case was one of unlike twins, the boy being normal and the girl Mongolian. This appears to be the only case reported in which Mongolism has occurred in unlike twins, the remainder having occurred in like twins, as in the present case. A case has been reported of Mongolism occurring in both twins by Hjorth[6].

The explanation recently offered by McLean, that 2 ova were fertilized by 2 spermatozoa, that the product of a normal spermatozoon and a normal ovum produced the normal child while the product of an abnormal spermatozoon and a normal ovum or a normal spermatozoon and an abnormal ovum produced the Mongol, may explain the mechanism of the occurrence of such a condition. But still one does not feel that the explanation is acceptable unless one can offer an etiological factor to explain why this particular spermatozoon or ovum should be abnormal.

It is not known whether these twins are monozygotic or dizygotic, but there is considerable evidence according to Newman[7], that nearly half of all same sexed twins are monozygotic. It would seem that the determination of this fact might offer a fruitful source of investigation in helping to determine whether the cause of Mongolism is maternal or paternal.

If these twins were monozygotic, they were fertilized by one spermatozoon. If this sperm is assumed to be responsible for the Mongolism, it must necessarily be able to produce both a normal and an abnormal fetus, a conclusion which is obviously not tenable. Thus, if these twins were monozygotic, it is not possible to assume that the cause is paternal. There is yet another possibility that the cause is due to a deficiency in intrauterine nutrition and so is maternal. But, single ovum twins have a common source of uterine nutrition and it is difficult to believe that the cause may be related to such a deficiency affecting the one without affecting the other.

If these twins were dizygotic, then the cause may be either due to the sperm or the egg, since each egg is fertilized by a separate sperm. It is possible for differences in intrauterine nutrition to be responsible for this condition, since double ovum twins have separate sources of nutrition.

It seems then that the determination of the monozygotic or dizygotic origin of such twins would aid in determining whether the cause of Mongolian idiocy, occurring in one of twins, has a maternal or paternal etiology. If they are monozygotic, it seems most logical to assume that the cause is not paternal. If dizygotic, it may be either paternal or maternal.

The number of corpora lutea which could be found in such a case would enable one to determine whether two eggs or one had been produced. It is to be hoped that some surgeon may have the opportunity to make such an observation during the course of a pregnancy, an observation which would appear to have fruitful possibilities for stimulating further investigation of the etiology of Mongolism.

BIBLIOGRAPHY

1. Thursfield, H.: Notes on Mongolism, Brit. J. Child. Dis., 18:205-207, Jan.-Mar., 1921.
2. Neumann, H.: Ueber en Mongoloiden Typus der Idiote, Berl. klin. Wchnschr., 30:210, 1899.
3. Shuttleworth, G. E.: Mongolian Imbecility, Brit. M. J., 2:661, Sept. 11, 1909.
4. Swanberg, H., and Haynes, H. A.: A Case of Mongolism in One of Twins, Arch. Neurol. and Psychiat., 2:717, June, 1919.
5. McLean, S.: Mongolian Idiocy in One of Twins, J. A. M. A., 78:13, Jan. 7, 1922.
6. Hjorth, Bodil: Nyt. Tidsskrift fur Abnormvaesenent,, No. 9, 1916.
7. Newman, H. H.: The Biology of Twins, University of Chicago Press, 1922.

PROTEIN SENSITIZATION, THE COMMON FACTOR IN WHOOPING-COUGH, ASTHMA, HAY FEVER, AND INFLUENZA.

By J. Francis Ward, M.D.

Brooklyn

The kinetic stream of the energy of life is marked by a main rate, a mode and a variability of motion. In health, these bear a balanced relationship which results in perfect harmony. That is, the bodily activities are synchronized; the "human machine" is perfectly timed. For instance the rate of normal inspiration bears an exact ratio to the rate of heart-pulsation.

In those diseases which it is my purpose here to discuss the governing source of this synchronism is disturbed; breathing becomes labored or spasmodic, its periodicity is lost.

Although these diseases were known and described by the earliest medical writers, among them Hippocrates himself, the fundamental cause is still unknown. The work of the last 75 years has brought out the facts of protein poisoning from pollens and from animal emanations together with the defective conditions of the body in which these poisons may induce irritation and end in respiratory diseases; but the ultimate in the etiology of asthma, hay fever, whooping-cough, and influenza remain unknown.

The theories of their etiology are, of course, numerous. Every new fact with regard to infectious diseases which medicinal research uncovers, is examined with reference to discovery of the final causes of these I am discussing.

Common colds, rhinitis, coryza, whooping-cough and influenza are unknown in the Arctic regions. This is accounted for of course, by a temperature which inhibits bacterial growths and by a limited flora. But it is also evidence against pyloric insufficiency as a fundamental cause. Improperly split proteins of food must occur in the human body in any habitat.

The symptoms and pathology of whooping-cough are the same as those of hay fever. In whooping-cough it is the upper respiratory tract which is affected—the trachea and glottis. In influenza, the bronchi are the seat of disease. The majority of whooping-cough cases occur in May, June, July, August and September—the season at which plant-pollination is at its height.

The epidemics of influenza, however, have started in the late Autumn, and are undoubtedly due to pollens the proteins of which form a virulent poison.

The symptoms at the beginning of both these diseases are: a feeling of heaviness and fullness in the head; sneezing; itching and burning of the nose and eyes (with lacrimation); the burning sensation is felt at the palate also. This is followed by vasodilation and, on more extensive absorption of the poison, by acute inflammation. When the poison reaches the intra-cellular tissues, there is edema and exudation. Nasal respiration becomes impossible and the pollen-laden air is inhaled through the mouth.

The poison irritates the peripheral nerve-endings in the palate and larynx, causing itching of the palate. A dry laryngeal cough develops. In whooping-cough the edema extends to the Eustachian tube and produces a sensation of tenseness. The glottis becomes edematous and causes the characteristic whoop. The whoop is more marked at night and this fact brings out the connection between this disease and the emanations from animal dust protein; the chicken, duck and goose feathers contained in the pillow are themselves a potent cause of protein poisoning.

Whooping-cough usually lasts for 8 or 9 weeks, during the pollinating season of the special plant or weed to which the child is sensitive.

At the seashore, particularly during a sea-breeze, or on a sea-voyage, the symptoms of whooping-cough are entirely relieved. The reasons for this disappearance are that at the seashore, the child is not in contact with the pollen, that the sea-breeze contains no pollen, and that while on the ocean he is out of reach of wind-blown pollens.

Whooping-cough is a forerunner of a later hay fever and asthma. Twenty-eight out of 50 cases of hay fever gave a previous history of whooping-cough during infancy. The remaining 22 could give no early history.

Up to the present time, bacteriology has shown no definite bacillus for whooping-cough. In 1906, Bordet[1] claimed that he found a small ovoid bacillus. The research work of other investigators has proved that *"bacillus pertussis"* occurs in only a small percentage of cases and that it is not constant. In influenza, the bacillus of Pfeiffer as a cause is neither definite nor constant and its etiological relationship to this disease is doubtful in many minds.

In both whooping-cough and influenza, however, streptococci have been found in great numbers; in the latter disease, the hemolyticus type prevails. The truth of the matter seems to be that some foreign agent causes their activity and that this agent may be pollens, since all cases occur during the season of plant pollination and show symptoms refereable to protein poisoning.

At one time during my service in the Base Hospital at Camp Upton, an epidemic of influenza prevailed. The early history of all the cases was the same; that is, there were at first symptoms similar to those of hay fever, then asthma (air-hunger) and these were followed by a prounced pneumonic type of influenza. On autopsy the pathological conditions were found to be those one would expect to find in asthma.

Our greatest number of cases occurred in the latter part of the month of September; at this time atmospheric pollen dispersion reaches its maximum. From the middle of October onward the epidemic gradually diminished and at the first frost was almost entirely gone. At this time there is no pollen in the air; and the underlying cause of the disease having disappeared no new cases developed. Then, and not until then the mortality rate became low, and the surviving patients made a quick recovery. In other words, the temperature and conditions of vegetation approached those of the Arctic regions and the disease was inhibited for natural reasons.

It seems to be entirely evident, then, that whooping-cough, asthma, hay fever and influenza are each caused by pollens, the specific plant to which an individual is sensitive being a matter of idiosyncrasy. The symptoms and pathology of each of these diseases are similar, as I have said. The focus of infection and the specific pollen are the variable factors which distinguish the diseases. Protein sensitization to a particular pollen, a particular animal or food seems to be due entirely to individual idiosyncrasy. The specific flora of different localities or different countries appears to govern both the type of infection and the season of its appearance. Scheppegrell[2], of Louisiana, has done notable work in identifying the incriminating pollen groups from different sections in the United States.

Thus, he states that Spring and Summer hay fever are caused by the pollen of hundreds of varieties of common grasses all over the country; that Fall hay fever is due to 6 common varieties of ragweed, but that in the Rocky Mountains and Pacific States there are 30 varieties of wormwood which replace ragweed as a causative factor in this disease.

One of the commonest grasses which produces hay fever, asthma or other forms of respiratory irritation is timothy. Yet a curious incident of recent occurrence has come to my attention which shows that timothy may have a quite different effect.

The incident to which I refer was this: During the Spring of the present year, an epidemic occurred among horses, the most marked symptom of which was a severe cough. A physician of my acquaintance made inquiry at certain stables. Upon asking what food the horses were being given, he was told that it was principally alfalfa. He then suggested that the alfalfa be withdrawn from the horses' diet and that timothy be substituted. His advise was followed and the horses immediately recovered from the cough.

I have stated that the ultimate cause of the respiratory diseases I am discussing is as yet unknown. In speaking of asthma, Brown[3] describes this disease as "dramatic in symptoms," "elusive in pathology," "cloaked in mystery," "sometimes called the epilepsy of the lungs." "Many things," he adds, "still need to be known before the problem of asthma is settled."

With regard to protein absorption, however, there are certain facts which appear to be quite clear. One is that, although the pollen protein at some seasons of the year reaches the nasal mucous membranes of all persons, only those in whom these tissues are weakened can parenterally digest them. Koessler[4], writing on this subject, say that "the human blood and all secretions of the mucous membranes of the body are *digestive fluids* and have normally very remarkable proteolytic properties." He adds that it is a well-known fact that the normal nasal secretion shows a decided bactericidal power and that this is doubtless "due to proteolytic enzymes whose presence has been experimentally established. This proteolytic enzyme of the nasal secretion in most people gradually splits the pollen, like any other ioreign protein, into harmless products, proteoses and animo-acids."

It is probably a parallel to what occurs in asthma arising from pyloric insufficiency. For if the food substances pass into the small intestines before their protein content has been split into harmless products, those proteins may be parenterally digested and the full power of their toxins liberated in the blood or bodily tissues.

It is the exact activity of the enzymes that cloaks asthma, and other respiratory diseases in "mystery." As Koessler says "the all-important factor is that this first parenteral intake of the foreign protein through a process not perceived by the individual whose tissue takes it up, has a two-fold effect: (1) It injures the epithelial cells of the mucosa and the endothelial cells of the finer capillaries in such a way that the mucosa remains permanently in a state of increased permeability for the protein (endothelial lysis); and (2) it brings about a new function of those cells, which consists in the production of a specific protective ferment direct against the specific pollen protein—the local tissue becomes sensitized."

It is these tissue changes in reaction to the primary absorption of the protein of a specific pollen or animal emanations which accounts for chronic respiratory diseases and probably also for heredity.

As further evidence of the confusion as to the fundamental causes of asthma and its respiratory allies against man I may mention an editorial opinion[5] in the Journal of the American Medical Association during 1908. After stating that asthma may be due to nasal abnormalities, bronchitis, hay fever, dust, drug irritants, etc., it was added that asthma is frequently a neurosis alone, not being caused by any one particular condition or irritation. "This is pure 'cussed' asthma."

Another writer states in Progressive Medicine in 1909[6] that asthma is "antiphysiological unruliness; the sympathetic and cerebrospinal system go shares in the mutiny." Gibson[7] writing in the British Medical Journal in 1911 conceives of asthma as "pure spasmodic nerve disorder—original sin of the respiratory center without any initial peripheral irritation." I mention these opinions simply for their bearing on the suspected reaction of the emotions to ductless gland activity. The well-known harmful effects of negative emotions may be a clue to the governing activity of the enzymes and some investigators have already gone out of the field of physiological pathology in an effort to trace the ultimate cause of these diseases to psychoneuroses. Whether or not the relation of proteins to enzyme activity will be found there, remains for the future to prove. The patent fact at present is that no one theory will explain all phases of these diseases.

The treatments applied for the relief of hay-fever, asthma, whooping-cough and influenza are almost as varied as the theories of their etiology. They extend from suggestion to immunization by vaccine therapy. According to Davies[8], for example, asthma is a physiological disturbance and has no pathology of its own, climate and season do not play the part as contributing causes which have been credited to them. He finds when the asthmatic individual's metabolic capacity and the amount of exercise he takes are used as a guide to the amount of food he requires (and takes), then the asthma ceases, in most cases. A more popular treatment at present is pollen vaccinotherapy and the literature today contains most frequent reports of this method of overcoming these diseases. The endocrine theory has brought forward treatment by extracts of the products of the ductless glands, notably pituitrin. In some quarters only drugs are recommended, and frequently the treatment prescribed is simply palliative.

Whatever the true cause of respiratory diseases may be there are certain phases statistics reveal as occurring in the majority of cases. These are allergy and anaphylaxis. In hay fever and hay fever asthma, allergy indicates the congenital form of hypersensibility on inhalation of pollen protein. Anaphylaxis indicates sensitization of an allergic subject resulting from exposure to pollen protein in excess of inherited resistance[2]. Hence, the respiratory diseases instead of being disease entities of many phases may be varied anaphylactic reactions to the proteins to which the patient is sensitive. This may account for the large percentage of previous attacks of whooping-cough in the history of the cases of influenza during the epidemic at Camp Upton of which I have spoken.

This experience emphasizes the urgent necessity for the control of whooping-cough in the dangerous years of childhood. In a recent report from Massachusetts, Henry[9] gave the following data: From 1913 to 1919 there were 37,367 cases of whooping-cough causing 2,384 deaths, giving a fatality rate of 6 per cent. Approximately 33 per cent. of these cases of whooping-cough were in children under 3 years of age; for a period of years (1913-1918) 90 per cent. of the deaths from whooping-cough were in children under three; the apparent fatality rate for the group under three in 1918 was 23.5 per cent. During the 6 year period (1913-1918), the total of deaths from whooping-cough was 2,065.

If in addition to this fearful mortality rate in infancy, whooping-cough produces sensitization that can be dormant, as in the cases of influenza I have reported, it gives another aspect to disease prevention in the years of infancy. It teaches the importance of wide-spread popular education with regard to the dangers of this disastrous disease.

Attention should be fixed not so much on the medical care of the patient after whooping-cough has manifested itself, although that phase of the problem certainly must not be neglected, but on the broadcasting of instructions for keeping children so robust that their natural powers of resistance form an effective barrier to all the so-called infectious diseases.

REFERENCES

1. Bordet, J., and Genou, O.: The Microbe of Whooping-cough, Ann. de l'Inst. Pasteur, 20:731, (Sept.), 1906.
2. Scheppegrell, W.: Allergy, Anaphylaxis and Immunity of Hay Fever and Asthma. Med. Rec., 98:216 (Aug. 7), 1920.
3. Brown, O. H.: Asthma, St. Louis, C. V. Mosby, 1917.
4. Koessler, K. K.: The Specific Treatment of Hay Fever (Pollen Disease). (Forchheimer's Therapeusis of Internal Diseases.) 5:665, 1917.
5. Editorial, Dept. of Therapeutics, J. A. M. A., 51:2158 (Dec. 19), 1908.
6. Ewart W.: Diseases of the Thorax and its Viscera, including the Heart, Lungs and Blood-vessels, Progr. Med., 3:75, 1909.
7. Gibson, G. A.: The Varieties and Treatment of Asthma, Brit. M. J., 2:791 (Oct. 7), 1911.
8. Davies, B. C.: An Etiological Study of Asthma as a Basis of Treatment, Interstate M. J., 22:1111 (Nov.), 1915.
9. Henry, J. W.: A Brief Statistical Study of Recent Experience with Measles and Whooping-cough in Massachusetts, Am. J. Public Health, 11:302 (April), 1921.

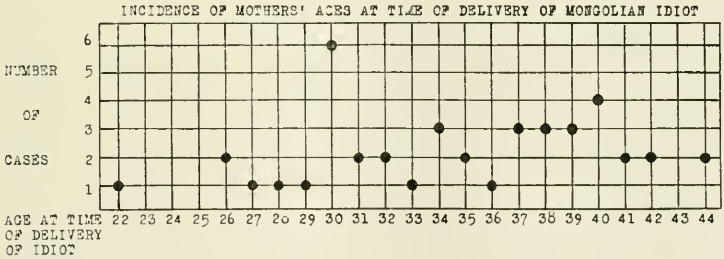
A REPORT OF 150 CASES OF MONGOLIAN IDIOCY*

By Frederick H. von Hofe, M.D.

South Orange, N. J.

The following report includes 150 cases of Mongolian idiocy which were admitted to the Out-Patient Department at the Babies' Hospital from January, 1917, to April, 1922, inclusive. Of these, 79 were males, 59 were females, and in 12 instances the sex was not stated in the history. There were 148 white patients and 2 colored patients.

The youngest case was in an infant 10 days of age, and the oldest in a child of 8 years. Of the 150 cases, 60 or 40 per cent. were 6 months of age or less at the time of admission to the Out-Patient Department; 35 cases or 23 per cent. were between 6 months and 1 year of age; 35 cases or 23 per cent. were from 1 to 2 years of age; and 20 or 13 per cent. were 2 years of age or older.



In only 42 cases was the age of one or both parents recorded. The age of the youngest mother at the time of delivery was 22 years, and that of the oldest mother 44 years. Among 36 or nearly 86 per cent., the mother was 30 years of age or over at the time of delivery, and in 23 or 55 per cent. the mother was 35 years of age or over. The father's age was recorded in 41 cases, and in all but 5 the father was as old or older than the mother.

The number of the mothers' pregnancies recorded ranged from 1 to 18. In 14 or 9.3 per cent. of all the cases, the Mongolian idiot represented the mother's only pregnancy. In 12 other cases, the idiot represents the only pregnancy that resulted in a living infant, no record being made in these cases, however, of the history of abortions. Therefore, in 26 or over 17.3 per cent. of the 150 cases, the idiot represents the mother's only pregnancy resulting in a living infant. In only one case is the Mongolian idiot the first of a series of pregnancies, 3 normal children following the delivery of the idiot.

---

*From the dispensary service of Dr. Stafford McLean, The Babies' Hospital, New York City.

In 97 cases or nearly 65 per cent. of all the cases, and nearly 72 per cent. of 135 cases in which a complete history of the pregnancies is given, the Mongolian idiot is the last pregnancy. In only one do we have a record of pregnancies before and after the birth of the idiot. This, however, is not conclusive evidence that the vast majority of cases is the last pregnancy, as most of our patients at the Babies' Hospital are under 2 years of age; and it follows therefore that in most cases we are dealing with the child born of the last pregnancy.

In 104 cases the mother was questioned regarding her history of miscarriages. Twenty-four of these or 23 per cent. gave a history of one or more miscarriages. Thirteen had 1 miscarriage; 7 had 2; 2 had 3; 1 had 4; and 1 had 5.

The character of the labor was recorded in 133 cases. It was stated to be normal in 122 or 92 per cent. In 3 cases the labor was "difficult"; 5 cases were "instrumental"; 5 were breech deliveries; and in 17 the character of the labor was not recorded. Four of the infants were delivered at the 7th month, and 4 at the 8th month of pregnancy.

The smallest infant delivered was 2 pounds; the largest 12 pounds. The weight records were obtained from the mother. In 91 cases the weight at birth was given and of these the average was 7 pounds. Fifty-six or 61.5 per cent. of those recorded were under 7.3 pounds at birth. Thirty-two were 6 pounds or under.

A congenital heart lesion was recorded in 14, or 9.3 per cent. of all the cases. Other associated conditions noted were the following: nystagmus in 3; convulsions in 3; oscillation of the head in 1; exophthalmus in 1; undescended testicle in 1; double inguinal hernia in 1; dislocation of the knee in 1; talipes equinovarus in 1; ichthyosis in 1; icterus in 1.

In 25 cases it was stated the age at which the infant was able to support its head. Ten were able to support the head at the time of admission, and of these 8 were able to hold up the head at 5 months of age or over, and 4 at 10 months of age or over. Fifteen patients could not hold up their heads without support at the time of admission, and of these 14 were 5 months of age and over, 8 were 10 months of age and over, and the oldest was 17 months at the time of admission.

In 31 cases it was stated the age at which the patient could sit up without support. Eleven of these could sit up at the time of admission, and of these all were able to sit up at 7 months of age or over, and 8 at 10 months of age or over. The oldest was 2 years. Twenty could not sit up without support at the time of admission, and 18 of these were 8 months of age and over; 13 were 10 months of age and over; and the oldest was 17 months.

The history of dentition was elicited in 20 cases. Ten of these had the first tooth erupt prior to the date of admission, and of these 6 had the first tooth erupt at 15 months of age or over. The youngest age at which the first tooth erupted was 6 months, and the oldest 3 years. Ten cases did not have the first tooth at the time of admission, and of these all were 9 months of age and over, and 6 were 15 months of age and over.

In 16 cases a record was made of the age at which the patient said single words. Nine of these spoke single words prior to the time of admission. Of these, the earliest age at which the single words were spoken was 10 months, and the latest 3 years; and 8 of these first spoke single words at 16 months of age or over. Seven were not able to speak at the time of admission, and of these 4 were 15 months of age and over at the time of admission.

The weight at the time of admission was recorded in 139 cases. Fifteen or 10.8 per cent. were of normal weight for age*; 13 or 9.3 per cent. were over weight from 1 to 8 pounds; and 110 or 79 per cent. were under weight from 1 to 14 pounds. The 11 over weight averaged 4 pounds over weight and the 92 under weight averaged 4.5 pounds under weight.

The height at the time of admission was recorded in 79 cases. Twenty-five or 31.6 per cent. were normal; 10 or 12.6 per cent. were from 1 to 6 inches above normal height for age; and 44 or 56.5 per cent. were 1 to 15 inches below normal height for age. Those over normal height for age averaged 2 inches above the normal, and those below normal height for age averaged 2.6 inches below normal.

---

*All standards of measure are taken from Holt, L. Emmett and Howland, John, Diseases of Infancy and Childhood, 1917.

The occipito-frontal circumference was recorded in 80 cases, and of these 32 or 40 per cent. were within the normal measurement for age; 3 or 3.7 per cent. were above the normal; and 45 or 56 per cent. were below the normal.

In 51 cases the size of the fontanel was recorded, and in 10 or nearly 20 per cent. the fontanel was definitely late in closing; and in 2 cases at 4 months of age the parietal bones were widely separated from anterior to posterior fontanel.

SUMMARY.

1. Mongolian idiocy occurs more frequently in males than in females, the ratio being 4 to 3.
2. In 55 per cent. of the cases recorded the Mongolian idiot was born to a mother 35 years of age or over.
3. In nearly 72 per cent. of those cases in which a complete history of the mothers' pregnancies is recorded, the Mongolian idiot represents the mothers' last pregnancy.
4. In 92 per cent. of 133 cases recorded, the birth of the Mongolian idiot was normal.
5. Of 91 cases recorded, 61.5 per cent were under 7.3 pounds at birth.
6. A congenital heart lesion was noted in 9.3 per cent. of all the cases.
7. In the majority of cases recorded there was delayed dentition, delay in ability to hold up the head, to sit up, and to speak.
8. Of 139 cases, 79 per cent. were below the normal weight for age.
9. Of 79 cases, 56.5 per cent. were below the normal height for age.
10. Of 80 cases, 56 per cent. had an occipito-frontal circumference under the normal for age.
11. In 20 per cent. of 51 cases, the fontanel was definitely late in closing.

AN EASY AND RAPID METHOD OF PREPARING PROTEIN-MILK.*

By E. H. Bartley, M.D.
Brooklyn, N. Y.

The term protein-milk as used in this article may be defined as a mixture containing a relatively large amount of milk proteins with a reduced amount of milk-sugar and salts, and a minimum amount of fat.

The method usually employed in preparing eiweissmilch is tedious and can not be done in the home by the average mother and seldom by the nurse. A substitute protein-milk, answering nearly every indication for the above, and which any intelligent mother can prepare in a short time, is the following: It consists in separating the casein from commercial buttermilk, washing it with water and adding it to skim milk in variable amounts to suit the case in hand, with or without the addition of flour gruel or raw white of egg.

The process of preparing the food is about as follows: To a pint or a quart of buttermilk add an equal volume or more of boiling water. The curd separates at once in a flocculent form. Allow it to set 5 to 10 minutes, decant off the supernatant fluid, and add more warm water, let set as before, decant off and repeat this process a third time. This completely removes the whey from the curd. Drain off all the water possible and then add a pint of skim milk and stir vigorously with an egg beater, previously dipped in boiling water.

If we have used a pint of buttermilk to start with we will have the curd of 2 pints of milk in the volume thus obtained, which is usually about 20 ounces. This mixture will then contain approximately 5 per cent. of proteins, 2.8 per cent. of sugar, less than 1 per cent. of fat and 0.5 per cent. of salts.

If the above 20 ounces be made up to one quart with water, it will contain approximately 3.5 per cent. protein, 2.4 per cent. sugar, 0.5 per cent. fat and 0.35 per cent. salts.

If one quart of buttermilk be taken to start with, a pint of skim milk be added to the curd and made up to one quart with water, the composition will be approximately: Protein 4.6 per cent., sugar 2.4 per cent., fat 0.5 per cent. and salts 0.35 per cent.

---

* Demonstrated before the Brooklyn Pediatric Society, April 27, 1921.

If desired, a cereal gruel may be used for making the final volume up to a quart. The protein may be increased by the addition of the white of 1 or 2 strictly fresh eggs to the quart of food.

The finished product is free from insoluble curds and remains in suspension on standing. The taste resembles that of diluted milk and is, of course, not perceptibly sweet. Saccharin may be used to sweeten, if desired. The advantage of this process is its flexibility and simplicity.

No strainers are used, which can contaminate the food. Any person of average intelligence can prepare the food in any kitchen in a half hour. The shorter time required is a matter of great relief to the mother or nurse.

The completed food is a smooth permanent mixture and will therefore not clog the nipple.

For obtaining the skim milk a Chapin dipper or a small rubber tube for use as a siphon will be needed. All other apparatus needed will be found in every kitchen.

The siphon method gives a skim milk containing less cream than can be obtained with the dipper, and is easier to use.

The casein in this food is partly in the form of casein lactate, probably a part of it in the form of free casein and a part as casein calcium as it occurs in cows' milk. In the original formula of eiweissmilch a part of the casein has been converted into paracasein-calcium and a part into casein lactate as it exists in buttermilk, with an excess of free lactic acid, and swarms of bacteria of many kinds. In this food the free lactic acid and the most of the bacteria have been removed.

JOSEPH E. WINTERS

In the death of Dr. J. E. Winters, a collaborator of Archives of Pediatrics, on October 4, 1922, the profession has lost an ardent worker and an able diagnostician who was a teacher of clinical medicine from the time of his graduation.

Dr. Winters was born on January 11, 1848. He was interested in medicine early in life and was encouraged by a physician of high ideals, Dr. George F. Cady of Nichols, N. Y. He entered the Medical Department of New York University and received his degree in 1872. During his course of study his eyesight failed but he continued his studies with the aid of fellow students who read to him so that he memorized both text-books and lectures. After graduation he passed an examination for a position on the house staff of Bellevue Hospital where he served as house surgeon, 1873-74, and as house physician, 1874-75, and as assistant curator and pathologist to the hospital from 1875-79. He was instructor and demonstrator of anatomy at the University from 1873-84 and taught physical diagnosis under Dr. A. L. Loomis, who was visiting physician at Bellevue Hospital and professor of medicine at the University. Dr. Winters was lecturer on diseases of children, in the grades of instructor, clinical professor and professor, in the Medical Department of the University from 1884 to 1897. In the latter year he resigned from the faculty of this institution and became professor of diseases of children in the Medical Department of Cornell University, a position that he held until his resignation in 1919. For a short period he was on the staff of the New York Post-Graduate Medical School and Hospital.

Soon after leaving Bellevue Hospital, Dr. Winters established a hospital quiz that was noted for its intensive character and the insistence placed on a quiz man's ability to memorize medical subjects and to answer questions rapidly. The success of this quiz gave Dr. Winters a wide reputation and brought him many students. His private practice, which was large, became a consulting one mainly through physicians who had been in his classes.

The incisive teaching of Dr. Loomis appealed to Dr. Winters and he was influenced also by the works of Watson, Stokes, Trousseau and Niemeyer. Interest in clinical medicine was always of paramount importance to him, and, added to diagnostic ability, enabled him to cope with serious illness in a manner that gave confidence both to physician and patient. Observation of disease in all phases never tired him. Not only did he draw on large classes at College and Demilt Dispensary for clinical material but he would take sick children from their homes to show rare cases at his lectures.

Dr. Winters was one of the founders of the American Pediatric Society and also an organizer of the Pediatric Section of the New York Academy of Medicine of which he became chairman. He was for many years a member of the Milk Commission of the Medical Society of the County of New York. In addition to his position in pediatrics at Demilt Dispensary, he was physician at the Willard Parker and Riverside Hospitals and was also connected with Christ Hospital, Jersey City, St. Joseph's Hospital, Yonkers, and with the Mt. Vernon and Flushing Hospitals.

Among the medical writings of Dr. Winters are the following: "Is the operation of tracheotomy in diphtheritic croup dangerous? When should the operation be performed?" 1884; "Clinical observations in the use of antitoxin in diphtheria," 1896; "Feeding in early infancy," 1903; "Etiology of rheumatism," 1907.

Dr. Winters was emphatic in both his teaching and writing. His lectures, which were clinical, were crowded by students and physicians who received a lasting impression of his personality. His medical articles reflected in terse sentences his independent judgment based on the results of extensive experience in clinical fields. Such independence is unusual and Dr. Winters will be missed by many physicians, some of whom were formerly his students, and by a large circle of medical friends and admirers who received advice and instruction from him. W. L. C.

Joseph E. Winters

SOCIETY REPORTS

THE NEW YORK ACADEMY OF MEDICINE. SECTION ON MEDICINE.

Stated Meeting, Held March 21, 1922.

RUSSELL L. CECIL, M.D., *in the chair.*

SYMPOSIUM ON ACIDOSIS.

THE THEORY OF ACIDOSIS.

DR. DONALD D. VAN SLYKE made this presentation (see also Journal of Biological Chemistry, Sept., 1921), in which he defines acidosis as an abnormal condition caused by acid retention, that was, the formation and retention of acids at a rate in excess of their absorption. The elimination of acids occurred in 2 ways —by way of the lungs and by way of the kidneys. From the lungs volatile acids were eliminated of which the only one was carbonic acid; from the kidneys we eliminated a number of acids of which one classical example was butyric acid. The retention of acids resulted in an increase of the acid base of the blood. The possible variations in the acid base balance of the blood might be stated as follows: The blood bicarbonate might be high, low or normal and in each of these conditions the hydrogen ion concentration of the blood might be high, low or normal. There were thus classified 9 theoretical possible conditions, only one of which was normal, namely, that in which both the bicarbonate and hydrogen ion concentration were within normal limits. As a result of the recent work of Y. J. Henderson and Haggard, of Scott, Melroy and Collip, of Davies, Haldane and Kennarvey, of Grant and Goldman, of Peters and Bar, and others, it was known that 6 of these abnormal conditions could occur and the writer had previously shown that 2 of these conditions could occur. It had been shown that the average normal range of hydrogen ion concentration of the blood plasma was 7.4, the normal range being from 7.30 to 7.50. Under extremely abnormal conditions it might fall as low as 6.95; before this point was reached coma occurred and it was doubtful that a further decrease was compatible with life. By voluntary deep breathing, carbon dioxide might be thrown off until the blood alkalinity rose to a hydrogen ion concentration of 7.7 to 7.8, at which point symptoms of tetany appeared. It therefore appeared that the extreme reaction compatible with life lay between 7.0 and 7.8 hydrogen ion concentration. Other body fluids probably closely approximated the blood plasma in their reaction. From a review of the literature, Peters and Bar had concluded that in normal men the total carbon dioxide content of the whole blood at 40 mm. carbon dioxide tension, at 38°C., fell between 43 and 45 volumes per cent. Of the total carbon dioxide about 19/20 was in the form of bicarbonate. When the carbon dioxide ténsion was other than 40 mm. the figures changed. When the carbon dioxide tension was increased the hydrogen ion concentration was also increased and the ratio BA : HA for hemoglobin and other buffers was lowered, since it changed in accordance with the equation $\frac{[BA]}{[HA]} = \frac{[K]}{[H^+]}$ (BA equals the concentration of alkali salt of buffer acid, and HA equals concentration of free buffer acid.) In consequence of the change base other than bicarbonate is set free and combines with CO_2 to form $BHCO_3$. A rise in the carbon dioxide tension therefore increased not only the $[H_2CO_3]$ but also the $[BHCO_3]$ and vice versa. Consequently above and below 40 mm. CO_2 tension the normal limits of blood bicarbonate and total CO_2 content rise and fall as indicated by two absorption curves. These curves were plotted by Peters and Bar in 1921. Dr. Van Slyke explained these curves by means of a diagram which represented the combined variations in blood bicarbonate and by hydrogen ion concentation. The 9 possible combinations were represented by 9 areas in the diagram. The most marked and clear characteristic clinical effect of uncompensated alkali excess was the development of symptoms of tetany when the alkalinization proceeded sufficiently far, but from this fact one was not justified in assuming that all tetany was either caused by or accompanied by alkalosis. The effects of uncompensated carbon dioxide deficit on the urine were similar qualitatively to those of the uncompensated alkali excess; there was a decrease of ammonia excretion, an increase in urinary hydrogen ion concentration, and an excretion of sodium bicarbonate. The rate of bicarbonate excretion observed was much less (only a fraction of a grain per hour) when it was raised by over-breathing than when it was raised by the administration of bicarbonate. The ultimate symptoms were again those of tetany. The characteristic signs of voluntary deep breathing for an hour or less were those of abnormally high hydrogen ion concentration whether the increase was caused by an increase in the numerator or a fall in the demoninator of the [$BHCO_3$] : [H_2CO_2] ratio. Where there was compensated alkali excess or compensated carbon dioxide excess the hydrogen ion concentration was normal. The state of the acid base balance of the blood was the same whether the original disturbance was alkali retention or carbon dioxide retention. Hence the condition might be described as compensated alkali excess or compensated carbon dioxide excess, according to whether the original disturbance was due to alkali or to carbon dioxide retention. A normal acid base balance represented the balance which was practically always found in the resting individual at ordinary altitudes. A compensated alkali deficit or a carbon dioxide deficit represented a condition in which the available blood alkali was lowered but in which a normal hydrogen ion concentration was maintained because the fall in [$BHCO_3$] was balanced by a proportional fall in [H_2CO_3]. Compensated alkali deficit was a condition occurring as the result of accelerated production of non-volatile acids (diabetes) or their retarded elimination (presumably nephritis). The physiological effects of uncompensated carbon dioxide excess were seen in an accelerated excretion of ammonia and titratable acid by the urine, the same as when the acid base balance was shifted toward the acid side by retention of non-volatile acids. There was also an increase in the minute volume of air expired in the apparent attempt to get rid of the excess of carbon dioxide, unless the respiration center was deadened, as by morphine. In uncompensated alkali deficit the [$BHCO_3$] of the blood was lowered without a proportional fall in the [H_2CO_3]. In consequence, there was a fall in the [$BHCO_3$] : [H_2CO_3] ratio, and the hydrogen ion concentration. This was the condition described by Hesselbalch and Gammeltoft as uncompensated acidosis, and was most frequently met with in diabetes and nephritis acidosis in the premortal period. In deep anesthesia there was an uncompensated alkali deficit and a carbonic acid retention. This combination seemed to occur also in some cardiac cases. In order to determine which one of the possible variations existed in the blood in vivo, it was necessary to ascertain 2 of the involved variables, such as the pH, $BHCO_3$, and the H_2CO_3. With any 2 of these a point could be located in its proper area in the diagram, but with one alone it could not be done. Under most conditions, pathological as well as normal, the hydrogen ion concentration was kept normal. When this was the case, the determination of either the carbon dioxide tension or the bicarbonate in either the plasma or whole blood sufficed to indicate the condition. The plasma bicarbonate might be estimated by the gasometric method of Van Slyke and Cullen or by the totration method of Van Slyke, Stillman and Cullen. These methods sufficed for making the estimations in metabolic conditions in diabetes, nephritis and the metabolic disturbances of infants, in which the source of acid base disturbance was retention of non-volatile acids while the respiratory control of the blood reaction was unaffected. These methods were not adequate to cover conditions in which respiratory control of the blood reaction was so disturbed that the hydrogen ion concentration became abnormal as happened in anesthesia. In making estimations it must be remembered that the normal curves varied for different individuals and in studying an abnormal condition comparison should be made with the normal figures for that individual.

CLINICAL TYPES OF ACIDOSIS WITH REFERENCE TO THEIR SYMPTOMS AND TREATMENT.

Dr. J. H. Means, of Boston, stated that nature abhorred any change in blood reaction. The hydrogen ion concentration of the blood, as shown by Y. J. Henderson, was chiefly dependent on the reaction between carbonic acid and bicarbonate, thus

$$[H+] = K \frac{[H_2CO_3]}{[BHCO_3]}$$

in which the brackets denote concentration and K is a constant.

Yandell Henderson has put this algebraic expression into terms of plane geometry in the so-called CO_2 diagram of the blood. It consists essentially in the dissociation curve of the blood for CO_2, with points upon it representing arterial and venous blood. Such a diagram gives us the essential facts of acid-base balance, the hydrogen ion concentration and the level of blood alkali, and helps in visualizing the nature of the functional derangement, that is to say the morbid physiology of a given case.

The main mechanisms for preserving normal blood reaction are the pulmonary, the renal, and the neutralization of acid through the increased production of ammonia. The pulmonary is the quick acting; the renal, the slow acting, compensatory mechanism. The pulmonary mechanism can temporarily compensate for disturbances in acid-base balance by varying the tension of CO_2. It is the kidney however which must accomplish the final adjustment and restore normal relations by the elimination of the excess of acid or base as the case may be.

Acidosis may occur in the sense of an actual shift in blood reaction in the acid direction, or simply as a condition of lowered level of blod bicarbonate with no change in blood reaction. The former condition is one in which the compensatory mechanisms have been unequal to their task, therefore "uncompensated acidosis." The latter is one where compensation has been complete, therefore "compensated acidosis."

Clinically we have metabolic acidoses, alimentary acidoses, and retention acidoses. The first is that group in which there is an abnormal production of acid in the body due to deranged metabolism. The acidosis of diabetes is of that type. The second is that in which acidosis results from the ingestion of acids, mineral for example, or formic acidosis is methyl alcohol poisoning. The third, the retention acidoses, are those in which one of the compensatory mechanisms is unequal to its task. In the end stages of nephritis we have a retention acidosis of renal origin. It results from the accumulation of acid metabolites which the kidney is unable to remove. In pneumonia, Barach, Means and Woodwell have found occasionally a carbonic acidosis due to a failure of the pulmonary mechanism in its acid-base regulating function. The same has been found by Peters in heart disease and by Barr in normal persons after very violent muscular work.

A case of retention acidosis of renal origin was studied by Means, Bock and Woodwell. This patient, a man with chronic arterioschlerotic nephritis, showed a hyperpnea of a most distressing type. His carbon dioxide diagram showed a very low alkali level and an uncompensated acidosis. The cause of the low alkali level was the failure of the kidney to eliminate acid. The hyperpnea was the effort of the pulmonary mechanism to compensate for it. The effort was great but still insufficient. This may in part have been due to the fact that his respiratory bellows was mechanically impaired through the presence of edema in the lungs. After large doses of sodium bicarbonate, his alkali level rose above normal, his blood reaction became more alkaline than normal, an actual alkalosis being produced, and his hyperpnea entirely ceased.

A diabetic on the verge of coma also showed a low alkali level but here the pulmonary response had been sufficient, the acidosis was compensated. On dietary restriction and with increase in fluid intake his curve rose to the normal level without any administration of sodium bicarbonate.

In one case of pneumonia studied by Barach, Means and Woodwell there was found to be a rise in bicarbonate level after the crisis, and in another, such a rise was produced by giving alkali.

In regard to the treatment of the several types of acidosis it is pointed out that in the retention variety the administration of alkali is indicated, but its beneficial effect will be but temporary unless the cause of the retention, that is to say the insufficient compensatory mechanism, can be removed. In the retention acidosis of renal origin in chronic nephritis this cannot be done; in the temporary renal insufficiency of Asiatic cholera, as pointed out by Sellards, alkali administration may save life. In the retention acidosis of pulmonary origin, alkali administration, theoretically at least, would seem indicated, but there is but scanty actual data on the degree of its helpfulness. In alimentary acidosis, alkali is always indicated and may save life. In the metabolic varieties, the prime indication is not to treat the acidosis by giving alkali but to remove the cause, the disturbed metabolism. In diabetics this can often by done without the use of alkali, and the cause of the acidosis being checked, nature takes care of the acidosis itself. As to whether alkali ever should be used in the acidosis of diabetes is a much disputed point. Personally I feel that it usually is unnecessary but that in certain extreme cases it may be desirable.

ACIDOSIS IN CARDIAC DISEASES.

Dr. John P. Peters, Jr., of Yale Medical School, stated that 2 or 3 years ago Dr. Barr and he attempted to analyze the factors concerned in the acid base equilibrium of the blood in cardiac dyspnea by simultaneous determination of the carbon dioxide and oxygen content of arterial and venous blood and the carbon dioxide absorption curve of the blood. They had constructed a chart similar to Dr. Van Slyke's to express the behavior of the blood of each individual towards carbon dioxide; and upon this chart they had interpolated the values obtained from arterial and venous blood after the proper corrections for oxygen unsaturation had been made. By this means they were able, within certain limits of error, to estimate not only the carbon dioxide tension, but. also the hydrogen ion concentration or true reaction of this blood as it existed in the body. Ten determinations were made on patients with severe cardiac dyspnea. Lantern slides of charts were presented which brought out the following points: Cardiac decompensation with dyspnea might be associated with a true acidosis. There was, however, no evidence that such an acidosis was characteristic of cardiac dyspnea. If one studied a number of normal persons, it appeared that the resting level of the carbon dioxide-absorption curve was a more or less fixed characteristic of a given individual, as was the hydrogen ion concentration of the blood. Hence, to determine whether or not, under any given abnormal conditions, pathological or physiological, an individual exhibited an alteration of the normal conditions of acid base equilibrium in his blood, it was not sufficient to compare him with other normals. The only proper criterion was to be found in the state of his own blood under normal, resting conditions. Unfortunately it had been impossible to employ this criterion in the majority of their cases. It was interesting to note, however, that in all instances, during decompensation and dyspnea, the absorption curves lay in the lower normal limits, possibly indicating a general tendency towards a reduction of the alkaline reserve. The same was true of the values for hydrogen ion concentration; although they overlapped the range of normal values, no high normal values appeared. There was no satisfactory explanation for a reduction of the alkaline reserve in cardiac dyspnea. Such a change was presumptive evidence of a relative accumultion of non-volatile acids in the blood. This might be produced either by a diminution in the acid excretion or an increased acid production. So far such attempts as had been made to demonstrate a diminution of acid excretion had proved unsuccessful. The methods pursued had not been entirely satisfactory. The occurrence of a carbon dioxide accumulation was much more comprehensible. If one assumed that the average patient with cardiac decompensation and dyspnea had no acidosis, there was, nevertheless, strong presumptive evidence that his mechanism for the elimination of carbon dioxide was less efficient than normal and that he had a particular predisposition to a carbon dioxide acidosis. Peabody had shown that the cardiac patient with dyspnea must breathe a much larger volume of air in order to eliminate the same amount of carbon dioxide. This was found to be true in all the cases in this series whether they presented a clear cut acidosis or not. In other words they maintained a normal acid base equilibrium in the blood only by a greater expenditure of respiratory effort. If one went further and studied the expiratory air in such patients it appeared that each unit volume of air from the lungs contained less carbon dioxide than the same unit volume in normal persons. In normal persons the facilities for the exchange of gases between the blood and air in the lungs were so perfect that the carbon dioxide concentration was almost the same in the air as it was in the blood. In cardiac dyspnea this was not the case; the carbon dioxide concentration of the pulmonary air was maintained constantly at a lower level than was that of the arterial blood. There seemed to be some impediment to the free exchange of gases between the pulmonary blood stream and the pulmonary air that necessitated the maintenance of a greater pressure difference between the two in order to effect the same exchange of gases. Dr. Barr had recently applied to the study of exercise the same method which they had employed for the study of cardiac dyspnea. His investigations showed that the effect of violent exercises was to lower the alkaline reserve and to increase the acidity of the blood. If such a change was added to the already existing disturbance in such patients the result was obvious. One must get an additive effect that was serious. Patients with cardiac dyspnea experienced difficulty in eliminating normal amounts of carbon dioxide. The respiratory mechanism broke down completely when the demand made upon it was increased. Those who exhibited no definite changes, lived precariously, escaping a carbon dioxide acidosis only by greatly increased activity on the part of an inefficient respiratory mechanim. Dr. Peters did not discuss the causes of this change, but stated that the investigations of Peabody and his co-workers suggested that the main trouble lay in the lungs and might be due to the engorgement of the pulmonary circulation. The part which stasis in the systemic circulation might play was not so clear, but seemed less important on both experimental and theoretical grounds. The only clear indications for therapy, which they had, seemed to point to improvement of the cardiac and circulatory conditions and the facilitation of respiration. Even in those patients who presented a deficiency of alkali in the blood, Dr. Peters said he had seen no good come from the administration of bicarbonate. In one or two instances bicarbonate had seemed to increase an already distressing edema. The indications for oxygen therapy were not so clear as they were in pneumonia, because the oxygen unsaturation of the arterial blood in cardiac dyspnea was seldom very great.

ACIDOSIS IN DIABETES.

Henry Rawle Geyelin stated that the past 6 years covered the period during which what was commonly known as the modern treatment of diabetes had been employed. The 2 outstanding principles which the modern methods of treating diabetes had yielded in regard to our knowledge of acidosis in diabetes were, first, and probably most important, although it had been recognized in isolated instances before 1915, that acidosis might be relieved by fasting or near-fasting, that was by the complete withdrawal of food or reduction to an extremely low caloric intake; secondly, the equally important principle was that acidosis might be produced by high fat feeding, and by high fat feeding was meant high fats both relative and absolute, that was relative to other ingredients and irrespective of other ingredients. Both of these principles were now so well recognized that it would be a waste of time to discuss the technic involved in their application. Suffice it to say that in the main the medical profession as a whole had applied these principles pretty generally to the treatment of diabetes, and also there had been mistakes made that were becoming less frequent. These mistakes had been twofold. One was the universal application of fasting to all kinds and conditions, not only of acidosis but of diabetes as a whole. A second mistake was that fat restriction had been carried in some instances to an absurd and actually harmful extent, resulting in many instances of unnecessary undernutrition and a consequent down grade course of the general condition, if not of the diabetes itself. In diabetes, especially if there was acidosis, caution in fasting must be observed and also in cases of mild or severe acidosis complicated by infection. Again, in certain obese individuals (though many obese individuals could be fasted without danger), one had to exercise care particularly when obesity was associated with renal disease. In these individuals it was unwise to begin fasting as soon as the patient entered the hospital if there was any evidence of a moderate to severe acidosis. The symptoms of diabetic acidosis had fallen into some disrepute due to the fact that we had at our disposal a very accurate chemical method of determining the degree of acidosis. The work spoken of tonight by Drs. Van Slyke, Means and Peters showed that by the blood bicarbonate alone we could not always judge of the actual existence of acidosis or its extent when it did exist. For that reason, as well as to help interpret the blood bicarbonate actually found, Dr. Geyelin said he wished to make a plea for closer observation of the early clinical symptoms in the patient seen from the outside, for frequently it was found that the early symptoms of acidosis had been overlooked. Woodyatt had pointed out that the blood carbon dioxide falling between 30 and 40 volumes per cent. might in certain unusual cases be accompanied by some early clinical symptoms of acidosis, whereas in other patients, whose blood bicarbonate fell between 30 and 23 volumes per cent. it might to the uninitiated show very few if any symptoms of acidosis. Probably one reason for this was that symptoms of restlessness, nervousness, anorexia, headache, and flushed appearance were only too commonly overlooked as symptoms of acidosis. As an instance of the fact that clinical symptoms must by no means be relied upon entirely, Dr. Geyelin cited the case of a boy 10 years of age, who came to the hospital. His first blood bicarbonate was 16 volumes per cent. No clinical symptoms of acidosis had been noticed in this child. It was only with the greatest care that a slight hyperpnea could be detected. The question of the treatment of acidosis was an interesting one, concerning which there was much difference of opinion. Some believed that sodium bicarbonate should not be used in the treatment of diabetes, while others held that it should be used to the fullest extent. He thought all were agreed that fluids should be forced. There was an equal division of opinion in regard to sodium bicarbonate, as to whether one should feed carbohydrates. In cases of precoma, in which the blood bicarbonate was below 25 volumes per cent., it had always seemed rational to him that the use of sodium bicarbonate was indicated, and this in spite of the fact that he had seen many cases recover without the use of sodium bicarbonate, by simply forcing fluids by mouth, by bowel, and sometimes intravenously, and if possible the use of more carbohydrate in the form of fruit juice and oatmeal gruel. He felt sure that the largest percentage of good results were obtained if one employed all these measures. We should bear in mind in the administration of sodium bicarbonate that small doses, applied without much hope of doing good, were useless, but when bicarbonate was given in from 10 to 20 gram doses every hour with fluids forced to 4000 to 6000 c.c. for 24 hours and then about one gram of carbohydrate per kilogram of body weight given in the form of fruit juice and oatmeal gruel, the best results would be obtained. Where there were symptoms of complete coma, the essayist did not believe that anything would bring the patient out of that condition, although in one unusual case large amounts of bicarbonate apparently restored a child to life. However, he had never seen such a result before. Three children out of 525 patients had a blood bicarbonate of 13 volume per cent. and had lived; none of them were in complete coma. In one of these cases the blood bicarbonate was 9 or 10. Three out of 500 odd cases was not a great many but it indicated that the blood bicarbonate, although apparently hopelessly low, might not necessarily mean a fatal outcome. There was another type of acidosis seen in diabetes which was very often the result of the long continued use of an older form of treatment, namely, the low carbohydrate, high fat and high protein diet. In this type of so-called low grade acidosis, the blood bicarbonate was from 35 to 45 volumes per cent.; ketone substances were present as indicated by the ferric chloride and other tests. This form of acidosis was due either to high fat diet or high fat diet combined with some kind of infection—a low grade infection. That brought up the question why one did not always find this result of high fat, high protein and low carbohydrate diet. That question could not yet be answered, but time played a very important part as many cases illustrated. The patient on this diet became sugar free and ketone free and perhaps gained 3 or 4 pounds and then suddenly developed small amounts of ketones in the urine followed by quite large amounts of sugar and the development of acidosis. The reduction of that type of acidosis might be accomplished by a decrease in the amounts of fat and an increase of carbohydrates in the diet. If any argument were needed the experience of the last 6 years ought to carry conviction that the modern methods of treatment in diabetes were superior to the older methods. The statistics of the Presbyterian Hospital for the period from 1912 to 1914, inclusive, show all the cases of diabetes in the hospital were treated by the older methods. There was an average of 6 or 8 deaths a year in diabetic coma. The total number of diabetics a year averaged about 45. In other words the percentage of diabetic patients dying in coma was 12 to 14. Similar statistics collected over the past six years, up to and including 1921, showed a total of 520 diabetic patients. Of these the average number dying from coma was 4 a year, making the percentage of those dying from diabetic coma less than 6 per cent. That spoke eloquently for the newer methods of treatment if one could judge anything by statistics. Dr. Geyelin then alluded to the more recent work of Woodyatt, Newberry, Shaeffer, Ladd and Palmer which was interesting from the point of the proportion of carbohydrate or glucose to fatty acid substances. Probably all interested in the subject knew that in a rough way the diet of normal man was constructed so that one gram of carbohydrate to four of fat would prevent the appearance of ketones in the urine. As to the relation of these elements of the diet in diabetics, studies made up to the present time did not permit one to draw conclusions. Many observations with different proportions of fat and glucose had been tried and the work afforded a pleasing attempt to discover a standard for the proportion of these substances which would permit a much more accurate method of feeding this class of patients than any yet devised. It must be borne in mind that in these various ratios the aim must be to make the diets isocaloric with the patient's caloric needs. If that was done and the diet computed for the basic needs of the individual, supplying in the food what the patient would use from his own tissues, if starved, one would get a diet which, in certain milder and fairly severe cases of diabetes, would preclude both a glycosuria and a ketonuria, and one would gradually increase that diet by addition to the basic caloric requirement. The only cases in which they had been able to apply these diets were in those in the precoma condition, and then had had to abandon them and resort to ordinary methods of treatment. Clearly the cause of diabetic acidosis had been advanced in the last 5 years but its solution was by no means at hand.

THE PHILADELPHIA PEDIATRIC SOCIETY.

State Meeting, Held May 9, 1922.

Horace H. Jenks, M.D., President, *in the Chair.*

INJURY TO THE CERVICAL CORD IN A CHILD OF ONE YEAR.

Dr. Frederic H. Leavitt, said: This case is of interest because it represents a type that is being frequently seen in nervous practice as a consequence of breech labor with its accompanying excessive neck traction and torsion resulting in hemorrhage into the cervical cord and the various types of paralyses resulting. Cases of flaccid and spastic diplegias and paraplegias coming to the nervous dispensaries give histories of breech presentations in many instances. The lesser hemorrhagic cases, as well as those with the larger hemorrhages with death resulting, are frequently undiagnosed and are puzzling to the practitioner. As these cases are being seen frequently and they are manifestly caused by excessive traction and torsion of the head this case is presented as a plea that this contingency be borne in mind in cases of delivery with the after-coming head.

The typical picture of the condition is as this child portrays. A flaccid paralysis of all muscles below the site of hemorrhage, with the arms held at right angles to the body and the forearm rotated upward as in the typical position of cervical cord injury. There is a flaccid paralysis of the chest wall muscles which, by the traction of the diaphragmatic pull causes a partial collapse of the thoracic cavity and a consequent lessening of air space with dyspnea resulting and a very enfeebled cry. There is also a flaccid paralysis of the abdominal wall resulting in a great ballooning of the cavity due to gaseous distention. There is paralysis of the sphincters of the bowel and bladder with a consequent dribbling of urine and feces. X-ray of the cervical spine are uniformly negative. The prognosis is invariably bad.

RAYNAUD'S DISEASE WITH REPORT OF A CASE 4 MONTHS OF AGE.

Dr. Percival Nicholson, stated: In 1862 Maurice Raynaud described a symptom-complex, later called Raynaud's disease. This is a vascular condition without organic disease of the blood vessels, usually of gradual onset, in which there occurs from time of time paroxyomal attacks of local syncope, or passive congestion (local asphyxia), with intense numbness and chilliness of the hands and feet, rarely nose and ears, of more or less symmetrical distribution. This by the disturbance of function may lead to a loss of vitality with necrosis. According to Raynaud the local condition depends on an undue irritability of the vasomotor center or centers, owing to which ordinary causes of stimulation, such as slight cold, produce exaggerated effects and result in prolonged paroxysmal contraction of the peripheral arterioles.

Most authorities give the age incidence from 18 to 30 years and state that females are more frequently affected. Poynton states that while not frequent in childhood, it occurs often enough to be recognized. Friedel reported a case at 6 weeks and Bock a case at 7 months. Colman reported a case at 8 months. Raynaud described 5 cases in childhood. It is more commonly found during childhood than generally thought. Cassier, in 168 cases, found 22 cases under 5 years and 8 cases between 5 and 10 years. Osler states that in 20,000 admissions to Johns Hopkins Hospital there were 19 cases of Raynaud's disease and states that "a case has been reported in a 6 months child."

The real cause is very obscure but exposure to damp and cold or a sudden drop in temperature are excitants of an attack in those subject to the disease. In mild types, Raynaud's disease tends to run in families. Hysterical and neurotic persons are more liable to attacks. Congenital syphilis is also a large factor. Cassier cites the case of a child 2 years of age with Raynaud's disease and having undoubted congenital syphilis responding to mercurial treatment. Some cases apparently follow infectious diseases.

The definition excludes organic disease of the vessels. The condition is a local spasm of the blood vessels. The gangrene which may follow is due to the mechanical obstruction of the blood supply.

The symptoms in children are similar to those in adults and exhibit all degrees of severity. The condition may persist for years and never go on to gangrene.

RAYNAUD'S ORIGINAL DIVISION OF THE SYMPTOMS. 1. *Local Syncope.* Mild cases begin insidiously, lasting from a few days to a month, and are shown by a dead whiteness of the part, usually fingers or toes. The parts feel cold and the temperature drops and associated is a sensation of numbness, pins or needles or heaviness. The ischemia lasts but a few minutes but may recur several times a day. When the spasm relaxes the part becomes red and may throb and pain. Parts affected are symmetrical as a rule.

2. *Local Asphyxia.* The parts affected now become very painful and are a dark dusky blue and icy cold. This stage lasts 3 or 4 hours. When the spasm relaxes there follows a stage of active hyperemia, with intense pain, throbbing and burning in character. The pain sometimes is terrific. Attacks return day after day or may disappear to appear again on exposure to damp and cold. This condition may go on for years without progressing to the next stage of

3. *Local Gangrene.* This follows usually after local asphyxia by the formation of blebs, or there may form dark discolored areas, which dry up and later separate with slight superficial loss of tissue. The part remains cold and there is usually associated very severe pain, localized to the area involved. The attacks may be single or repeated over days, months, or years. With successive attacks mutilation may become great. Between attacks there is no pain or discomfort. From frequent attacks the skin of the hands and feet may become indurated and suggest scleroderma. Nails may also become ribbed and discolored.

Coincident with the paroxysms of asphyxia, children may suffer with abdominal pain, usually epigastric. Some cases have heminglobinuria and paroxismal albuminuria.

Diagnosis is rather easy on account of the symmetrical distribution of the syncope or cyanosis and the paroxysmal character of the attacks.

It is almost impossible to tell the course of the disease, but the majority of the cases have only one attack. Raynaud gives the average duration as several months. Attacks in children are often severe. On the whole, the prognosis is favorable; many cases disappear without treatment.

Treatment. These cases need careful supervision of diet and should have warm woolen clothes, fresh air and sunlight. The drug treatment has not been very satisfactory. Cod-liver oil, iron, arsenic and calcium lactate and atropin have been used.

Barlow suggests the use of a constant or galvanic current. One pole is placed in a large basin filled with tepid, salt water and the extremity immersed in it; the other pole is placed higher up on the extremity and as much current given as can be comfortably borne. The current is made and broken at frequent intervals to produce moderate muscular contractions and the patient is encouraged to move the digits during the bath. Electricity relieves the attacks but apparently does not influence the course of the disease. Cushing used pneumatic compression of the extremity involved. By means of the arm band of a blood pressure apparatus he cut off the circulation for a few minutes and when the constriction was removed hyperemia followed with relief of symptoms. Massage and Swedish movements are indicated in the mild cases. Where gangrenous, keep parts dry.

I wish to report the following on account of its rarity at such an early age and on account of its severity, with marked improvement following treatment. Since beginning to treat this case I have seen another very mild one at 5 months and 2 cases at a later age. H. F., born November 31, 1921. Age 4½ months, weight 15 pounds 4 ounces c. c. Very marked blueness, both hands and forearms, sharply limited at the elbows. Feet and legs also deeply cyanosed as far as the knees. All the cyanosed areas were icy cold and the baby cried night and day with pain. Father well until 2 years ago when he had rheumatism, pneumonia and shortly after tonsilar diphtheria. Mother, good health, one miscarriage before first child. Brothers, one in good health. Short easy labor, birth weight 8 pounds 4 ounces. Almost from birth the baby's hands and feet were cold. Slight cyanosis first noted March 1, 1922, at 4 months old. March 7, 1922, the cyanosis became marked and the baby had marked attacks of abdominal pain more marked at night. Breast fed 2½ months. For 1½ months on condensed milk and oatmeal water. Recently whole milk formulae.

Examination. Weight 15 pounds, 4 ounces. Well nourished. Pulse lost at wrist. Temperature 98 3/5°. Marked cyanosis of hands, forearms, feet and legs.

Treatment. Calcium lactate gr. 10, t.i.d.

March 23, 1922. Degree and extent of cyanosis remains the same as on first visit. Extremities each given 3 to 5 m. m. amperes of galvanic current by the method of Barlow. Immediately a marked improvement and a return of the extremities to normal color for the first time. There was an increase of redness over the normal and the parts became warmer.

May 8, 1922. Child has had daily electrical treatments and has gradually improved, the condition being much better on warm days. Color now is normal most of the time and when altered shows only marked blanching and coolness of the part.

RABBIT HAIR ASTHMA.

Dr. Bret Ratner, of New York City, presented this study: A group of asthma cases were presented which were due to rabbit hair, which was found in the pillows, mattresses, comforters, felt-hats, factory dust, toys, and clothing. These cases would have remained unclassified had we not searched for the offending protein.

Rabbit hair as an etiologic factor in the production of asthma would at first-hand appear to be of little practical significance. But as we have shown, its distribution is very wide-spread, and it should be placed second to horse hair as a causative agent in the keratin group of asthmas.

While we have not been successful thus far in desensitizing this group of cases, the removal of the hair does relieve the patients of all symptoms. In our attempts at desensitization, attention is called to certain dangers inherent in this form of treatment and adrenalin should always be kept on hand to cope with any exigency which may arise.

Dosage undoubtedly plays a great rôle in the actual production of attacks. Humans are capable of showing what might be called anti-anaphylaxis.

Eczema, vomiting, angioneurotic edema, urticaria, conjunctivitis may all occur as a direct result of contact with animal hair, besides the classical symptoms of asthma.

The sensitization in our series of cases appears to be of acquired origin, and the hair itself, and not any volatile emanation, is undoubtedly the causative agent. I would therefore like to suggest that rabbit hair and all fine dust-producing substances, be kept out of pillows, mattresses, clothing and toys, etc., that are used for infants and young children; and infants suffering from coryza and recurrent bronchitis should be carefully studied from the standpoint of their being potential asthmatics.

SOME OBSERVATIONS ON THE WEIGHT OF SCHOOL-BOYS, AND THE INFLUENCE OF PHYSICAL TYPE.

Dr. Frederick Fraley said: These observations were made on the pupils of the Episcopal Academy, a private school for boys in the surburbs of Philadelphia, a country day-school where the pupils pass the entire day in an environment which provides the most modern methods for the mental and physical education and development of the boys.

The pupils come from the City and its surburbs, and are from a class which is able to provide the best advantages for its children, in food, housing, general hygiene, and the refinements of life. They represent a selected group whose average of physical well being, should be relatively high. As the school had just moved from the city, it seems fairer to consider these observations as of a high class city private school. In regards to private-school children, it has been observed that they are taller for their age and heavier for their ages than children coming from less favored social environment, but are lighter in weight for their height than other classes of the community.

Benedict and Talbot state: "The striking superiority in height to age and weight to age, of our private school children, is in part, at the sacrifice of what is commonly considered the most advantageous relationship between height and weight. In other words, in private school children, skeletal growth increases at a more rapid rate than general all-around development."

The idea, that such children belong to a forced or "hot-house" group appears, perhaps within certain limits, to be a fair criticism; but as the children who are able to attain to a comparatively high education, later on become the brain workers of the community, in the complex scheme of modern civilization, their possible inferiority of physique for muscular effort is negligible.

A confrere of the writer once said that mankind might be classified as belonging to one of two main types namely, "Berkshires" or "Razorbacks." A glance at the reader will identify him as a quite typical "Razorback" and other persons will be almost as readily distinguished as belonging to certain types. The point I especially desired to investigate was "What effect has type upon normal weight in school boys."

In making the observation upon 225 boys whose nearest age ranged from 7 to 19 years, he followed the plan adopted by Dreyer, of measuring the so-called stem-length and the chest circumference at the level of the nipples and predicting the weights from his tables which are based upon weight for stem-length, and weight for chest circumference. I also checked up the results I obtained, with the tables constructed by Gray based on his study of about 400 boarding school boys in New England.

The chart subjoined, is a summary of this investigation, and shows the prediction-weight errors, for each of 3 physical types of school-boys, both by Dreyer's and the "Ideal" tables of Gray. The letter L represents the long slender type; W the well developed type; and S the stocky or stout type. Three boys were so fat, and 6 so thin that they were distinctly abnormal and therefore not included.

In classifying the types, the general impression of each boy's physique was first noted. Then the measurements were taken.

CHART

		Dreyer Average % Error	Gray Average % Error	Dreyer			Gray		
Type	Boys			Too High	Correct	Too Low	Too High	Correct	Too Low
L	101	5.40	4.54	64	6	31	55	8	38
W	105	3.52	4.74	35	14	56	12	9	84
S	19	10.40	13.00	0	0	19	0	0	19
Total	225	4.94	5.30	99	20	106	67	17	141

For the slender boys, Gray's tables are superior, but in the muscular, Dreyer's average error was less. His experience leads him to believe that the circumference of the chest is the best single criterion by which to estimate weight.

Conclusions. The actual weights correspond closely with predicted weights, by both Dreyer's and Gray's tables, each of which consider chest-girth, together with length, in calculating a theoretical weight. Physical type should be considered in judging weight for an individual as compared with an average normal standard. An error of 5 per cent. either way, may be considered entirely normal, and any observed error, should have at least 5 per cent. deducted from it.

THE RELATION OF WEIGHT TO CHEST-GIRTH, STATURE, AND STEM-LENGTH.

Dr. Horace Gray, of Boston, read this paper. He stated: The literature is replete with proposed standards of normal weight based on height for the most part. Recently Pirquet has attracted attention to the sitting-height as a gauge of body weight, and Dreyer has similarly argued the advantages of the stem-length, a measurement nearly identical but more accurately measurable. The present paper presents the correlation coefficient calculated for 80 healthy men selected clinically as normal. The weight was studied in relation to the chest-girth, height, stem, and what is here called the short stem, or the distance cervical spine to ischial tuberosities (7c.). Attention is called to a similar order or correlation in the coefficients reported for Iowa school boys by Baldwin in 1921. Hence in predicting weight for ordinary clinical purposes, it seems probable that better results can be obtained by using besides height, the weight for chest-girth.

A chart is presented showing that the resting chest-girth in 114 school boys was nearly invariably smaller than the mid-way girth (the calculated average between the girth at full inspiration and complete expiration), and in many cases surprisingly close to the deflated girth. The conclusion is submitted, therefore, that it is preferable to measure both maximum and minimum girth at the nipple level. It is admitted that further evidence may show that there is greater advantage in using the deflated girth, as has generally been done by army examiners both abroad and in this country, and as also suggested this evening in discussion by Dr. Gittings. It is further granted that in children, especially under the age of about 7 years, forced respiration is sometimes difficult to secure and therefore the physician may often be obliged to be content with the resting girth.

Evidence is shown that the weight for chest in Americans is less than as represented by Dreyer's line, when one is dealing with bigger boys, i. e., those with a chest-girth over 80 cm. (32 inches) or weight over 118 pounds, or age of 16 years or more. The explanation may well be that first offered by Dr. Fraley, that Dreyer's subjects being English, were a stockier type.

BOOK REVIEWS

RICKETS. A STUDY OF ECONOMIC CONDITIONS AND THEIR EFFECTS ON THE HEALTH OF THE NATION. BY J. LAWSON DICK, M.D., ED., F.R.C.S., Eng., Deputy Commissioner of Medical Services, London Region, Ministry of Pensions. New York. E. B. Treat & Co., 1922. Price $5.50 net.

Dr. Dick has, in this book, made a most valuable contribution to an already voluminous literature on the fascinating study of that widespread disease, rickets. The whole subject is attacked in a masterly manner, and the reader is at once attracted by the thorough and business-like way the writer goes about his work. The text is divided into 2 main parts, namely, "The Geographical Distribution, Signs and Symptoms of Rickets" and "The Natural History of Rickets. The Etiology of the Disease and its Treatment". There is no phase of the question which is not covered with the greatest care, and the preparation of the volume must have entailed a prodigious amount of correspondence with other workers in distant parts of the globe, as well as wide travel, especially in America. The explanations profusely offered as to the rôle of vitamine deficiency and of improper diet in the causation of the disease, are not considered adequate by the writer. He writes that "it must be confessed that we are not yet in a position to state definitely what is the exact cause of rickets, though the field of enquiry can almost certainly be narrowed down to the conditions of vicious environment which prevail at their worst in slum areas. These are confinement and the breathing of a vitiated atmosphere in overcrowded and badly ventilated rooms, lack of sunlight, and the loss of opportunities for proper exercise." The historical, the statistical, the economic, the preventive and the curative aspects of what is known in Europe as the "English disease" are set forth in detail. All in all, the reviewer has never had the good fortune to read a monograph on this important subject, which was so complete in its scope and so well grounded in its dicta. It compels and holds attention as much from the clarity of style and expression, as from the soundness of the views and the profundity of the investigations of the author. The binding is strong and serviceable, the paper is of good quality, the impression is clear, and the arrangement and "set-up" attractive. Lastly, it is not expensive, so that it will not have the handicap of high cost; therefore, there is no reason why it should not have the wide distribution which its sterling excellence deserves.

W. H. D.

L'ADENOPATHIE TRACHEO-BRONCHIQUE SIMPLE CHEZ L'ENFANT, PAR HENRI FORGERON. LIBRAIRIE LITTERAIRE AND MEDICALE, Louis Arnette, Paris, 1922.

Forgeron publishes the results of a vast amount of work on a subject which is of great importance, but which receives scant attention from the ordinary text-book on pediatrics. He reports, in full, the results of autopsies on nineteen children who were free from tuberculosis, but where there was found pronounced bronchial adenopathy. A bibliography of 159 references shows how thoroughly the literature was combed by the writer in his efforts to cover his subject thoroughly. He believes that infection of the tracheobronchial glands is no exception to the general rule of gland infections. These glands are of particular interest from their anatomical relations to the hilum of the lung, on which they act principally by the accompanying peri-adenitis. Forgeron finds that whooping-cough does not consistently cause this condition but that measles and grippe do so almost constantly. Typhoid may cause it by means of accompanying lung processes, whereas tonsils and adenoids do not produce it by a course of continuity through the cervical lymphatic chain, but by a descending respiratory infection of the bronchi. The direct cause of simple tracheobronchial adenopathy is always an infection of the lower respiratory passages; when this infection attacks glands already inflamed, for instance by tuberculosis, then we get a "mixed" adenitis. Dr. Forgeron is to be congratulated on having made a real and valuable contribution to pediatric literature.

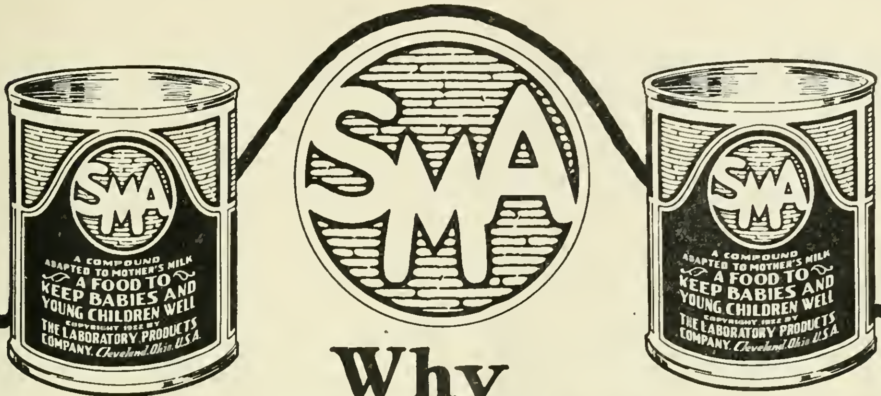
W. H. D.

L'ENFANT ET SON MEDECIN, PAR ALBERT BALL. A. Maloine and Fils, Paris, 1922.

This is somewhat on the order of the American "quiz-compend" and after a tabulation of drugs and their doses the greater part of the text is taken up with an alphabetical consideration of the diseases or abnormal conditions of infancy with special attention to treatment. The fact that the impression is made on India paper makes it possible to crowd over four hundred pages into a remarkably small sized book; on the other hand, the thinness of the paper allows the print on the reverse page to show through and make reading difficult. As a ready-reference handbook, Ball's work will be of service especially to French practitioners inasmuch as the drugs and their preparations are naturally those in use in France and to be found in the French pharmacopeia. Anything like a complete consideration of diseases and their treatment is impossible in a work of this kind, for example, hysteria has only one page devoted to it. W. H. D.

THE DISEASES OF CHILDREN. BY THE LATE SIR JAMES FREDERIC GOODHART, BART., M.D., LL.D. ABERD., F.R.C.P. Eleventh edition. Edited by George Frederic Still, M.A., M.D., F.R.C.P., Professor of Diseases of Children, King's College, London; Physician for Diseases of Children, King's College Hospital; Physician to the Hospital for Sick Children, Great Ormond Street. With 60 illustrations. New York, Paul B. Hoeber.

This present edition of an English classic should be well received, especially in England where the preceding ten editions have served so many generations of students. The revising of the book has been thoroughly done by Doctor Still and he has incorporated in it many of the latest advances in pediatrics which seem likely to be of real value. Of especial interest to the reviewer were the chapters on rheumatism, and diseases of the skin. An appendix containing many formulae, and one containing various recipes for preparing food should prove of value. Taking it all in all it is a well conceived, valuable book. H. R. M.


SMA
A COMPOUND
ADAPTED TO MOTHER'S MILK
A FOOD TO KEEP BABIES AND YOUNG CHILDREN WELL
COPYRIGHT 1922 BY
THE LABORATORY PRODUCTS COMPANY. Cleveland, Ohio, U.S.A.

Why every physician should know S.M.A.

SINCE S. M. A. requires only the addition of boiled water, whether for the month-old baby or the baby a year old, it assures the physician that his instructions for feeding will be carried out to the letter, and that no element in the baby's diet will be omitted.

Through S. M. A., baby feeding has been reduced to the simplest terms. But S. M. A. is of chief value to the physician not because of simplicity in itself, but because simplicity in this case means safety.

That this principle is sound is attested by the accumulated mass of successful experience in the use of S. M. A. in the hands of physicians during the past seven years.—The Laboratory Products Company, 1110 Swetland Bldg., Cleveland, Ohio.

Formula by permission of
The Babies' Dispensary and Hospital of Cleveland

Your druggist can supply you with S. M. A.

A FOOD TO KEEP BABIES AND YOUNG CHILDREN WELL
Adapted to Mother's Milk

The Management of an Infant's Diet

Mellin's Food contains 58.88 per cent of Maltose
Mellin's Food contains 20.69 per cent of Dextrins

a proportion of

Maltose and Dextrins

best suited to the carbohydrate needs of the average baby.

Mellin's Food contains 10.35 per cent of Cereal Protein.

Mellin's Food contains 4.30 per cent of Salts which consist mainly of Potassium Salts, Phosphatic Salts, and a small amount of Iron.

These facts should be considered in selecting a modifier of milk for infant feeding and these facts point out some of the reasons for the success of Mellin's Food which probably is unparalleled in any decade since the beginning of the study of scientific infant feeding.

Mellin's Food Company, Boston, Mass.

TO CONTRIBUTORS AND CORRESPONDENTS OF

ARCHIVES OF PEDIATRICS

Subscription $5.00 a Year, in Advance **Foreign, $5.50** **Single Copy, 50 Cents**

Editorial Communications address to H. R. Mixsell, M.D., 161 East 64th Street, New York
Business Communications address to E. B. Treat & Co., 45 East 17th Street, New York

ORIGINAL ARTICLES, brief reports of rare and interesting cases, or new modes of treatment are solicited, but none will be considered for publication except with the distinct understanding that it is contributed exclusively to this journal. Manuscripts must be typewritten, double-spaced, and the original, not the carbon, copy submitted. The editor and publishers will not be responsible for views expressed.

ILLUSTRATIONS, as in the judgment of the editor are necessary, will be furnished free when satisfactory photographs or drawings are supplied. Photographs must be clear and distinct; drawings must be in India ink on white paper.

COPYRIGHT.—Matter appearing in this journal is covered by copyright, but no objection will be made to its reproduction in reputable journals, provided proper credit be given.

REPRINTS of articles appearing among "Original Communications" may be ordered immediately upon receipt of galley proof by communicating direct with the publishers, E. B. Treat & Co., 45 East 17th St., New York, who will supply their schedule of prices.

DISCONTINUANCES. — The publishers must be notified when a subscriber wishes his journal stopped and all arrearages must be paid. Without such notification it is assumed that a continuance is desired. Journals returned are not notice of discontinuance.

REMITTANCES should be made by check, draft, post office or express money order. If currency is sent, the letter should be registered. Stamps in amounts under one dollar are acceptable.

CHANGE OF ADDRESS NOTICE should give both the old and the new and state if change is permanent or temporary.

CONTENTS

ORIGINAL COMMUNICATIONS

Precocious Puberty.
By Mark S. Reuben., M.D., and G. Randolph Manning, M.D. 769

Goitre in Children........................By Sidney Klein, M.D. 786

Rheumatism and Its Manifestations in Children Under Five Years.
By Alonzo DeG. Smith, M.D. 799

Congenital Cyanosis and Congenital Heart Disease, Without Murmurs.
By Mark S. Reuben, M.D., and Walter C. A. Steffen, M.D. 811

Continued on page v

Atophan

TRADE MARK

Rheumatism
Gout
Neuralgia
Neuritis
Sciatica
Lumbago
Migraine

What shall it profit the patients?

to have their sufferings relieved, if it's done by throwing into their most vital body machinery a monkey wrench like colchicum, the salicylates, or the old-time coal-tar derivatives—heart-depressants, kidney-irritants, intestine-disturbants.

Genuine ATOPHAN, devoid of all these drawbacks, is manufactured at our Bloomfield, N. J. plant by a special process, precluding the possibility of even traces of unpleasant empyreumatic admixtures.

Complimentary Trial Package and Information from

SCHERING & GLATZ, INC.
150 Maiden Lane, New York

Spasmodic Cough

Used at night vaporized Cresoline will relieve irritating cough and difficult breathing.

The cresols of coal tar as prepared in Vapo-Cresolene and vaporized, have an apparent antiseptic action in certain conditions of infected bronchii and are decidedly soothing and antispasmodic.

This has been demonstrated in the more than forty years since Cresolene was introduced.

For Whooping Cough, Spasmodic Croup, Bronchitis, Bronchopneumonia and the Bronchial complications of Measles and Scarlet Fever.

Literature on request.

The Vapo-Cresolene Co.

62 CORTLANDT STREET, NEW YORK, N. Y.
or Leeming-Miles Building, Montreal, Canada

B. B. CULTURE
—at your service

Nearly every day you will have opportunity to employ the lactic treatment in your work. There is no system of routine medication which will accomplish results quite so quickly and easily —*provided*, a capable culture is rightly used.

A prescription for B. B. CULTURE is an assurance of results.

Descriptive literature or samples for clinical trial will be gladly furnished on request.

B. B. CULTURE LABORATORY
Incorporated
YONKERS NEW YORK

CONTENTS—Continued

CLINICAL DEPARTMENT

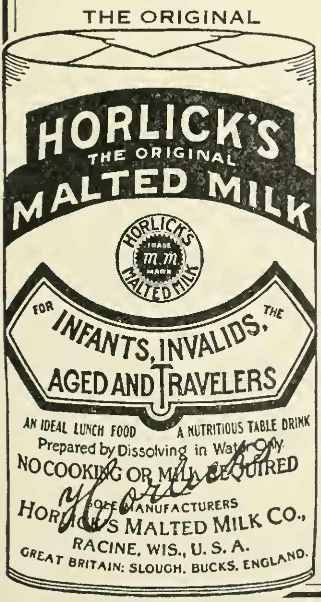
Acute Myeloblastic Leukemia....................By S. Horwitt, M.D. 819

Congenital Atresia of the Esophagus.....By Walter C. A. Steffen, M.D. 823

Chronic Hemolytic Jaundice................By William V. Levy, M.D. 827

Prescribe "Horlick's"

Avoid Imitations



FOR INFANTS, NURSING MOTHERS, AND DURING PREGNANCY

Endorsed extensively as a complete, satisfactory food for infants. Promotes health and normal development. Very digestible, and its cleanliness protects against milk-borne diseases.

A reliable supplementary diet with breast feedings. Increases and enriches the flow of milk of the nursing mother. During pregnancy its use promotes the welfare of both infant and prospective mother.

Sample and
printed matter prepaid

HORLICK'S, Racine, Wis.

In POST-FEBRILE ANEMIA and Convalescence from Acute Illness, where hematinic reconstructive treatment is indicated

Hemaboloids

is especially adapted. It is bland, palatable *and* easily acceptable to the irritable gastric mucous membrane, for it is axiomatic that organic iron is assimilable iron *and* free from all harsh or constipating effects.

¶ HEMABOLOIDS is fundamentally a food iron—based on the concentration *of* iron-bearing vegetable nucleo-proteins. Its blood building *and* restorative properties are increased *and* assured by the accompanying ingredients—bone-marrow *and* nuclein.

¶ When the iron action must be enhanced by adjuvants

HEMABOLOIDS ARSENIATED WITH STRYCHNIA

may be used—even in cases *of* debilitated digestive powers

CONTAINS $\frac{1}{40}$ gr. Arsenious Acid *and* $\frac{1}{80}$ gr. Strychnia to tablespoon

Samples and Literature on Request

The Palisade Manufacturing Company
YONKERS, N. Y.

British Journal of Children's Diseases

Quarterly

Annual Subscription, 25s net, Postfree   Single Copy, 7s 6d

ADLARD & SON & WEST NEWMAN, Ltd.
Bartholomew Close   London, England

Widemann's Evaporated Goat Milk

The milk that gets results when all other foods fail. Highly recommended by the foremost physicians and dietetians in cases of malnutrition, and as a diet for tuberculars and invalids.

Samples and literature on request.

Widemann Goat Milk Company,
San Francisco, Cal.

CONTENTS—Continued

ITEMS

Prophylaxis of Arthritism in Children.............................. 810

Pseudocyst in the Radius.............................. 822

Epituberculous Infiltration of Child Lung.............................. 830

MADE IN AMERICA

Maltine Malt Soup Extract

—with which the preparation of Malt Soup becomes easy and satisfactory.

Pamphlet reflecting the views of Dr. Keller will be sent to physicians on application.

THE MALTINE COMPANY, Brooklyn, N. Y.

GUDE'S PEPTO-MANGAN

(Liquid—Tablet Form)

furnishes the absorbable organically combined iron

that encourages the construction of red cells.
The red cells include the Hemoglobin—
The hemoglobin supplies the Hematin—
The hematin combines with the iron—
The iron carries the oxygen—
The oxygen stimulates the waste and repair
that constitutes life and living.

It is thus of unquestioned value in ANEMIC, CHLOROTIC and DEVITALIZED CONDITIONS.

Literature, samples and further information from

M. J. BREITENBACH CO.
53 Warren Street New York City

Our Bacteriological Wall Chart or our Differential Diagnosis Chart will be sent to any Physician upon request.

RICKETS

By J. Lawson Dick, M.D.

8vo. 518 pages. Ill. Cloth $5.50

JUST ISSUED

"The most elaborate and up-to-date study of rickets at present available."

"Will long remain a valuable volume of reference and a source of statistics."

E. B. TREAT & CO., PUBLISHERS
45 EAST 17TH STREET - - - - - NEW YORK

POND'S EXTRACT

POND'S EXTRACT CO.
NEW YORK AND LONDON

Coryza

There is no remedy more effective and reliabl in controlling acute colds of the nose and throat than Pond's Extract. Used as a douche or gargle—a tablespoonful to a half glass of warm water—it promptl allays irritation, reduces congestion and gives gratifying relief from the smarting and stinging that ar always distressing.

ONE OUNCE MAKES THIRTY-TWO OUNCES OF MALT SOUP

MALTZYMOSE

(NON-ALCOHOLIC)

A scientifically prepared MALT SOUP STOCK which meets the highest requirements of the medical profession.

MALTZYME COMPANY, Inc., *Malt Specialists*
300 Washington Street, Brooklyn, N. Y.

Used in the Feeding of Infants and for Aged and Post-Operative Patients

LISTERINE

A Non-Poisonous, Unirritating, Antiseptic Solution

Agreeable and satisfactory alike to the Physician, Surgeon, Nurse and Patient. Listerine has a wide field of usefulness and its unvarying quality assures like results under like conditions.

As a wash and dressing for wounds
As a deodorizing, antiseptic lotion
As a gargle
As a mouth-wash dentifrice

Operative or accidental wounds heal rapidly under a Listerine dressing, as its action does not interfere with the natural reparative processes.

The freedom of Listerine from possibility of poisonous effect is a distinct advantage, and especially so when the preparation is prescribed for employment in the home.

LAMBERT PHARMACAL COMPANY
SAINT LOUIS, MO., U. S. A.

SOLVE YOUR INFANT FEEDING PROBLEMS

DRYCO is not an artificially prepared infant food.

DRYCO is pure, carefully selected cow's milk from which the water has been removed by the rapid process (2 seconds).

DRYCO is uniform in composition and free from bacteria.

DRYCO supplies casein as colloidal protein, rendering the formation of thick, large curds impossible during digestion.

DRYCO presents the sugar without carmelization, the fat emulsion is broken up and the fat is easier digested than an equal weight of cream.

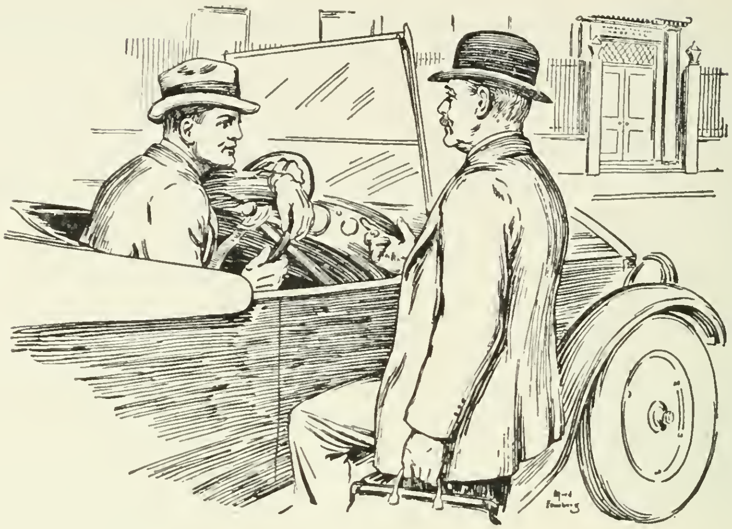
DRYCO retains the vitamins and anti-scorbutic properties of milk.

DRYCO is much more easily prepared than any other form of milk. It causes rapid gain in weight, flesh and strength. It can be adapted to the needs of any infant at any age.

Send for sample and literature "How to use Dryco and Protolac."

THE DRY MILK COMPANY
19 PARK ROW NEW YORK, N. Y.

"An International Institution for the Study and Production of Pure Milk Products."



DR. JUNIOR: "Before we go in, Doctor--you often speak of aborting pneumonia."

DR. SENIOR: "That is something which seems to you impossible——"

DR. JUNIOR: "Well, pneumonia—once it is clearly diagnosed—being a bacterial disease——"

DR. SENIOR: "Exactly. But, without the other inflammatory concomitants—impeded circulation with stasis—dead and dying (that is starved) blood cells—red and white; congestion of parts, favoring the pneumococcus with ample sustenance—; all these so-called mechanical factors, can be quickly, safely, antiseptically relieved by the prompt application of Antiphlogistine.

DR. JUNIOR: "It looks like plain, common sense, Doctor——"

DR. SENIOR: "Which all true science is. It is 'plain,' that is logical. It is 'common,' that is in the meaning that it belongs to everybody. The only trouble is that a few of us wish to keep ourselves excluded from the common lot."

DR. JUNIOR: "After all, though—my idea of a physician is the man who seeks first the relief and comfort of his patient, and who, having done his best to effect that, employs his leisure to go deeply into the mooted questions of scientific discussion.

DR. SENIOR: "In treating pneumonia do not overlook the important fact that Antiphlogistine assists the patient to exactly what he absolutely requires, Ease,—Rest,—Sleep——"

New Book *Just Issued*

RICKETS

By J. LAWSON DICK, M.D. Ed., F.R.C.S. Eng.

DEPUTY COMMISSIONER OF MEDICAL SERVICES, LONDON REGION,
MINISTRY OF PENSIONS.

In this volume we have the result of the studies of a physician who has devoted much of his time and energy to the record of all that is known about Rickets, not alone in its clinical aspects but as regards its geographical and race distribution, and etiology.

It is the most elaborate and up-to-date study of Rickets at present available and merits the attention of all interested in infant and child welfare, and will long remain a valuable volume of reference and a source of statistics and other information which has never before been so concisely and systematically brought together.

The author demonstrates that it is not the physician but the politician who is at fault.

8vo. 518 *pages, freely illustrated by charts, diagrams and colored plates.*
Cloth, prepaid, $5.50 *net.*

E. B. TREAT & COMPANY, ***Medical Publishers***
45 East 17th Street **NEW YORK**

ERGOAPIOL (Smith)

ITS UTILITY IN THE TREATMENT OF

Amenorrhea, Dysmenorrhea and other Disturbances of Menstruation

Despite the fact that Ergoapiol (Smith) exerts a pronounced analgesic and sedative effect upon the entire reproductive system, its use is not attended with the objectionable by-effects associated with anodyne or narcotic drugs.

The unvariable certainty, agreeableness and singular promptness with which Ergoapiol (Smith) relieves the several varieties of amenorrhea and dysmenorrhea has earned for it the unqualified endorsement of those members of the profession who have subjected it to exacting clinical tests.

DOSAGE: Ordinarily, one to two capsules should be administered three or four times a day

MARTIN H. SMITH CO.
NEW YORK, U. S. A.

A HELPFUL FACTOR IN TUBERCULOSIS

"Cod-liver oil is valuable, because: Its large amount of unsaturated fatty acids permits it to be almost entirely absorbed, and thus furnishes a large amount of fat food. It promotes the absorption of other fats. It favors the deposit of calcium in the tissues."

Kirschner: Amer. Rev. Tuberculosis, July,'22

The "S. & B. Process"

Clear Norwegian (Lofoten) Cod-liver Oil

is guaranteed a one hundred per cent. product derived from the livers of fresh-caught, **true Gadus Morrhuae,** and affords the physician an admirable means of administering this nutrient, rich in fat-soluble vitamin, in a form exceptionally palatable.

Liberal samples sent to physicians on request

SCOTT & BOWNE
Bloomfield, New Jersey
Makers of Scott's Emulsion

THE CRITICAL AGE

The age of
GROWTH—*of* STRAIN
—*of* INFECTION

THE importance of a correct diet during the age of growth cannot be overestimated. For the injury resulting from insufficient or inadequate food may be permanent in its effects.

VIROL is of especial value in the diet of School Children because it is digestible and easily absorbed. It contains the vitamins essential to growth, and enriches the diet in those elements essential to

MAINTENANCE OF HEALTH IN WINTER

It has been established by independent scientific tests that VIROL increases the power of resistance to disease of bacterial origin.

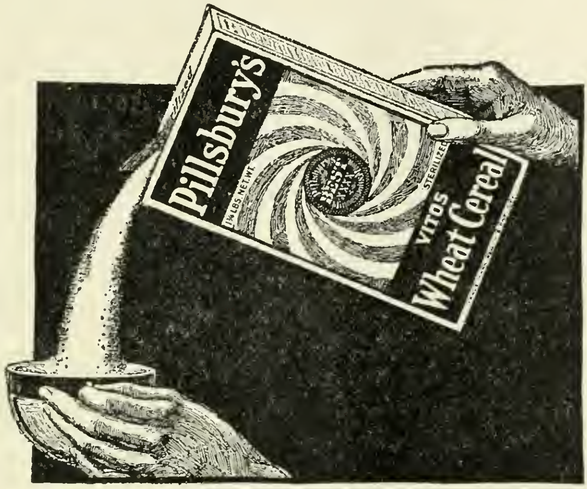
At all stages of Growth and Development VIROL is a food of very great value. Whether for the School Child, the Growing Babe, or the Expectant and Nursing Mother.

Contains
Bone Marrow, Beef Fat, Malt Extract, Eggs, Lemon Juice and Salts of Lime and Iron.

VIROL

Used in more than 2,500 hospitals and infant clinics in Great Britain

SOLE AGENTS FOR U. S. A.
Geo. C. Cook & Co., Inc., 59 Bank St., New York



Pillsbury's
Wheat Cereal

In order that you may know, at first hand, the real superiority of Pillsbury's Wheat Cereal, we gladly send to doctors, without charge, a full size package of this pure farina product.

Test it on your own table, or get a patient's verdict. Note especially its richness and *smoothness* when cooked. Because of its uniform granulation, Pillsbury's Wheat Cereal does not lump, when cooked according to directions on package.

Every step in the preparation of Pillsbury's Wheat Cereal, from the scientific selection of wheat to packing in air-tight containers, is completely handled by the Pillsbury Flour Mills Co. Thus we *know* and can *guarantee* what goes into it. And it's untouched by human hands. Request a package from us today.

PILLSBURY FLOUR MILLS COMPANY
MINNEAPOLIS, U. S. A.

Pillsbury's Family of Foods

Pillsbury's Best Flour · Pancake Flour · Wheat Cereal · Health Bran
Rye Flour · Durum Flour · Farina

NEW BOOKS ON THE CHILD

A UNIQUE AND IMPORTANT BOOK WHICH
COVERS A MOST VITAL PERIOD OF CHILDHOOD

THE HEALTHY CHILD *from* TWO TO SEVEN

By FRANCIS HAMILTON MacCARTHY, M. D.
Assistant Professor of Diseases of Children, Boston University

Contents by Chapters

I. Introduction.
II. The Home and Surroundings.
III. Food for Body-Building.
IV. Sleep and Rest.
V. Play and Growth.
VI. Child-Nature; Training and Education.
VII. Steady Nerves and Healthy Mind.
VIII. Care of the Child's Body.
IX. Common Diseases and Disorders of Childhood—Prevention of Contagious Diseases—Common Disorders of Childhood.
X. Common Emergencies of Childhood.

12*mo.* 251 *pages, cloth. Prepaid,* $1.50

FOOD, HEALTH and GROWTH

A Discussion of the Nutrition of Children

By L. EMMETT HOLT, M.D., Sc.D., LL.D.

This book takes up the entire subject of vitamines and shows how the knowledge of this subject has given a new basis for valuing foods and why certain foods, previously not considered of great value, have an important function of nutrition. The author, in fact, takes up *various practical means* which may be employed for improving the health of children; such as, the systematic teaching of health as a part of the curriculum of all schools.

CONTENTS

I. Nutrition in Relation to Growth, to Mental Progress and to Resistance to Disease
II. The Food Requirements of Children During the Entire Period of Growth.
III. The Conditions Upon Which Are Based the Requirements for Protein, Fat, Carbohydrate and Mineral Salts. The Percentage of the Different Food Constituents in the Diet of Children.
IV. Vitamines.
V. Practical Means by Which the Nutrition of Children May be Improved.
VI. Appendix—The Caloric Value of Common Articles of Food.

12mo. 287 pages. 24 charts and diagrams, cloth. Prepaid, $1.50

E. B. TREAT and COMPANY, 45 East 17th Street, New York

Peptogenic Powder

The Original "Milk Modifier"

Is offered upon this basic fact: It affords a milk food in close conformity with mother's milk, in chemical composition, in the nature of each constituent, notably and peculiarly in the character of its proteins. The Peptogenic Powder and "directions" express in practical terms the inevitable idea that an artificial food for infants should be in every respect like the natural food.

The milk prepared with Peptogenic Powder is a success; proves adequate and suitable for the nutrition of infants during the entire nursing period; often a success, too, after failure of various "infant foods," this simply because the baby gets for the first time a food like mother's milk.

That a good beginning makes a good ending would seem to apply particularly in the problem of providing a substitute for mother's milk.

FAIRCHILD BROS. & FOSTER, New York

Acute Respiratory Diseases offer an excellent opportunity to demonstrate the value of Therapeutic Immunization with Bacterial Vaccines

DATA FURNISHED ON REQUEST

Bacteriological Laboratories of
G. H. SHERMAN, M. D.
DETROIT

MERRELL-SOULE

BRAND

POWDERED PROTEIN MILK

is based on Prof. Finkelstein's original formula. Its lactic acid and vitamine content are extremely high. It is a complete Protein Milk. To insure freshness, it is sold only in first rate pharmacies recommended to us by physicians. We advertise only to the Medical Profession, and no feeding directions appear on the label. Samples of Merrell-Soule Powdered Protein Milk and scientific literature will be sent upon request.

A price reduction now effective gives liquid Protein Milk at an average price of nineteen cents per quart. Special prices to hospitals.

MERRELL-SOULE SALES CORPORATION, Syracuse, N. Y.
601 Elm St., Dallas, Tex. **804-805 Forsyth Bldg., Atlanta, Ga.**
OR
LUMAN R. WING & CO., 326 W. Madison St., Chicago, Ill.

Decide For Yourself!

You know whether a remedy is effective or not! You know what you want it to accomplish, and knowing your patient, you better than anyone else can tell whether it succeeds or fails.

It is on this basis—and this basis alone—that we ask your consideration for

Gray's Glycerine Tonic Comp.

If it does what you want it to do as a systemic tonic in overcoming functional weakness and bodily depression, and does it more promptly, uniformly and satisfactorily in case after case, than any other remedy, you will naturally continue to use it. If it fails, you certainly will not.

Could we take a fairer position in asking you to give Gray's Glycerine Tonic Comp. a reasonable trial in some difficult case needing tonic treatment?

Could we show greater confidence in its therapeutic efficiency?

The Purdue Frederick Co.
135 Christopher Street, New York

ARCHIVES OF PEDIATRICS

DECEMBER, 1922

HAROLD RUCKMAN MIXSELL, A.B., M.D., Editor

COLLABORATORS:

Rowland G. Freeman, M.D.	New York
W. P. Northrup, M.D.	New York
Henry D. Chapin, M.D.	New York
Francis Huber, M.D.	New York
Henry Koplik, M.D.	New York
Walter Lester Carr, M.D.	New York
C. G. Kerley, M.D.	New York
L. E. La Fétra, M.D.	New York
Royal Storrs Haynes, M.D.	New York
Herbert B. Wilcox, M.D.	New York
Charles Herrman, M.D.	New York
Wm. Henry Donnelly, M.D.	Brooklyn
Frank H. Richardson, M.D.	Brooklyn
Edwin E. Graham, M.D.	Philadelphia
J. P. Crozer Griffith, M.D.	Philadelphia
J. C. Gittings, M.D.	Philadelphia
A. Graeme Mitchell, M.D.	Philadelphia
Charles A. Fife, M.D.	Philadelphia
H. C. Carpenter, M.D.	Philadelphia
I. A. Abt, M.D.	Chicago
William P. Lucas, M.D.	San Francisco
R. Langley Porter, M.D.	San Francisco
E. C. Fleischner, M.D.	San Francisco
Oscar M. Schloss, M.D.	Boston
Maynard Ladd, M.D.	Boston
Charles Hunter Dunn, M.D.	Boston
Henry I. Bowditch, M.D.	Boston
Richard M. Smith, M.D.	Boston
L. R. De Buys, M.D.	New Orleans
Robert A. Strong, M.D.	New Orleans
John Foote, M.D.	Washington
Joseph S. Wall, M.D.	Washington
B. K. Rachford, M.D.	Cincinnati
Henry J. Gerstenberger, M.D.	Cleveland
Borden S. Veeder, M.D.	St. Louis
Frederick W. Schlutz, M.D.	Minneapolis
Julius P. Sedgwick, M.D.	Minneapolis
William Weston, Jr., M.D.	Columbia, S.C
A. D. Blackader, M.D.	Montreal
Edmund Cautley, M.D.	London
G. A. Sutherland, M.D.	London
J. D. Rolleston, M.D.	London
J. W. Ballantyne, M.D.	Edinburgh
James Carmichael, M.D.	Edinburgh
G. A. Wright, M.D.	Manchester

PUBLISHED MONTHLY BY E. B. TREAT & CO., 45 EAST 17TH STREET, NEW YORK.

ORIGINAL COMMUNICATIONS

PRECOCIOUS PUBERTY.*

By Mark S. Reuben, M.D., and
G. Randolph Manning, M.D.
New York.

In spite of the fact that our knowledge of the internal secretions is rudimentary and confused, great progress has been made during the last 10 years in dispelling the uncertainty which surrounds their function both in health and in disease. Everyone must be convinced that these organs are second to none in the body in their influence on physiology, pathology and clinical medicine. Disturbances in the internal secretions are responsible for anomalies of growth and morphogenesis, for disturbed nutrition, disturbed excitability of the nervous system, for loss of resistance to infection and intoxications; they are also responsible for certain dyscrasias and morbid temperaments; and the equilibrium of the nervous system, especially the sympathetic, is also maintained by the internal secretions.

---

* Read in part before the New York Academy of Medicine, Section on Pediatrics, December, 1920.

From the Department of Pediatrics, Columbia University.

In studying disturbances of the ductless glands, one fact has been clearly brought out and that is that the physiologic relation of all ductless glands is an intimate one, and that in pathologic conditions of one of them all the other glands are affected. The influence of one gland on another may be compensatory or inhibitory. The interrelation of the endocrine organs is a very close one and in determining which gland is the cause of disturbance in any particular case, we must always remember that certain symptoms may be due to overactivity of associated glands.

The relation of the glands to one another and to the body as a whole may best be expressed by substituting certain words (suitable to our subject) in a passage of Pope's "Essay on Man."

"Look round our internal secretions; behold the chain of love
Combining all below and all above.
See plastic nature working to this end,
The single atoms each to other tend
Attract, attracted to, the next in place
Formed and impelled its neighbor to embrace.
See secretions next, with various life endued,
Press to one centre still, the general good:
See dying glands life sustain,
See life dissolving vegetate again.
All glands that perish other glands supply,
(By turns we catch the vital breath, and die)
Like bubbles on the sea of matter borne,
They rise, they break and to that sea return.
Nothing is foreign; parts relate to whole;
One all extending, all preserving soul
Connects each gland, greatest with the least,
Made gland in aid of organs and organ of glands:
All served, all serving; nothing stands alone;
The chain holds on, and where it ends unknown."

In several previous papers[1, 2], we have discussed the anatomy, physiology and the various manifestations of dysendocrinism in children. In this paper it is our object to discuss precocious puberty and to show its dependence on disturbances of various duct-

---

1. Dyspituitarism—Am. J. Dis. Child., 1913.
2. Dysendocrinism in Children—Am. J. Dis. Child., 1915.

less glands. Precocious puberty is not a distinct entity; it is a variable symptom-complex depending on different causes. It may be due to functional disturbances, disease, or tumorous growth of the pineal, the gonads and the adrenals.

This paper is based on a study of 8 personal cases and a review of the whole literature (about 400 cases); by far the most extensive review of this subject ever attempted. In addition we have studied all cases with autopsy reports and have attempted to differentiate the various types clinically from a pathologic basis. We have also included a study of all cases of precocious pregnancy reported in the literature. This article is based upon a study of the following material:

	Females	Males
Precocious puberty	188	57
Tumor of ovary	23	0
Hyperplasia of adrenals or adrenal rests	8	1
Tumor of adrenal	17	4
Tumor of pineal	0	7
Tumor of testicle	0	1
Tumor of prostate	0	1
Precocious pregnancy	83	0
Personal observations	8	0
	327	71
Total number of cases	398	

Ratio of females to males (exclusive of precocious pregnancy), 243:71 = 3½:1.

Of the 398 cases, 64 came to autopsy or operation.

PUBERTY.

Until about the age of 13, the physical differentiation of the sexes, except for the anatomical peculiarities of the genital organs, is in our climate a trifling one. But at puberty occur important changes by which the sexes are so strikingly differentiated. Whereas in the growing boy all physical change takes the form of increasing strength and energy, in the development of the girl, we note the appearance of the rounded outlines so characteristic of womanhood; the features become regular, the breasts enlarge and pubic and axillary hair begin to grow. At the same time the voice alters, becoming less sharp with a softer quality and yet a fuller tone. The intellectual changes undergone by the girl at puberty are no less extensive and characteristic than the physical changes. The age at which the menarche usually occurs depends on various factors as climate, race, constitution, conditions of life, social circumstances and heredity.

The first appearance of menstruation is commonly preceded by various symptoms dependent on increased flow of blood to the genital organs, the so-called "molimina menstrualia." The prodromal symptoms which are observed in the majority of girls before the first appearance of menstruation are: swelling and tenderness of the breast, sensation of fullness and weight in the hypogastric region, moderate intestinal meteorism, sacrache, aqueomucous vaginal discharge and finally an itching sensation in the genital organs. After the first menstruation, 2 or 3 months may elapse before the girl menstruates again, but after a lapse of a year, the flow usually recurs at quite regular periods.

The greatest increase in size and weight occurs in the female sex at the time of the menarche. The earlier development of the female as compared with the male at the time of puberty is a constant phenomenon, to be observed in all races in every climate and in all strata of society. Puberty occurs in the female on the average about 2 years earlier than in the male and upon this difference the observed differences in growth depend.

The menarche, which forms a notable phase of the sexual life of woman, is characterized by great changes in the genital organs and in the vital processes connected therewith, by a strong tendency to suffer from a series of various pathological changes and disorders of function in the principal organs and a lessened general resisting power to disease; a change which finds its most definite expression in the well established fact that in this period of life the mortality among females is much greater than among the males of corresponding age.

The female reproductive organs now become powerfully active. The soft hairless vulva of the child becomes enlarged at the time of the menarche, by the deposit of fat, and its substance becomes tough and elastic. The growth of dense pubic hair begins with the appearance of hair along the middle of the mons and at the margins of the labia majora. Early sexual development is commonly indicated by an early and thick growth of the pubic hair. The infantile uterus is so proportioned that its neck constitutes the large part of the organs (as much indeed as two-thirds). At the time of puberty, the body of the uterus has already increased till its length is half of the entire organ. The characteristic changes in the ovary at the time of the menarche originate in the changes undergone by the ovarian follicles. A large number of small separate follicles is to be found already in the ovary of the new-born. Before puberty these graafian follicles are small vesicles; at the time of puberty certain large follicles are to be distinguished. At the time of the menarche the sexual impulse, which had been dormant, becomes strongly developed. Abnormal early puberty related to early practice of sexual intercourse is seen in many prostitutes.

Not uncommonly at this period of life, the growth of a goitre is observed. It is a well known fact that swelling of the thyroid body occurs chiefly at time of heat or rut in certain animals; this is especially well known to occur in the case of stags. Similarly during menstruation, a transient swelling of the thyroid body can sometimes be detected.

Ploss has collected observations made in various countries and towns regarding the age at which menstruation begins, and the mean results of these observations are given below.

The average age at which menstruation began was:

In Swedish Laplands	18 years	0 months	
In Copenhagen	16 years	9 months	
In Munich	16 years	5 months	
In Vienna	15 years	8 months	
In Warsaw	15 years	1 month	
In England	14 years	9 months	(Williams)
In U. S. A.	14 years	2 months	(Emmet)
In Marseilles	13 years	11 months	
In Calcutta	12 years	6 months	
In Egypt	10 years	0 months	
In Turkey	10 years	0 months	(Schaeffer)
In Negroes (Africa)	9 years	6 months	(Schaeffer)

In Arctic region menstruation occurs early and below the Equator late. (Schaeffer.) (See Steffanson J.A.M.A.)

Old World at 15.5 years; New World at 13.9 years.

In 6560 cases collected by Krieger, menstruation occurred in 51 cases under 11 years. The duration of sexual life varies from 6-46 years and the mean duration of menstrual activity is about 30 years. Extremely early appearance of the first menstruation has the same significance as abnormally late onset of menstruation; both indicate that sexual life will be of short duration. Sexual intercourse at a very early age accelerates the onset of the climacteric period and the termination of the sexual life. La Motte knew a woman who had 32 children before she was 45 years, when her husband died, and she continued to menstruate regularly to age of 61, at time of her death.

Precocity is a sign of biological inferiority. The majority of the children who show precocious physical development, die young. This probably gave rise to the saying "Immodicis brevis est aetas, et rara senectus" as applied to precociously intelligent children.

In the male, puberty is characterized by increased growth of genitals and by the development of secondary sexual characteristics (growth of hair in genital regions, about anus, in the axillas, on the face, and to greater or less extent on the remainder of the body, especially on the extremities; the voice deepens; increased development of the whole body with certain psychic changes take place.

A—STUDY OF CASES WITHOUT AUTOPSY REPORTS.

PRECOCIOUS PUBERTY IN FEMALES.

This synopsis is based upon a study of 188 cases of precocious puberty in females without autopsy reports or operation which have been collected from the literature.

Age at time of report.	Cases
0—1 year	9
1—2 years	13
2—3 years	17
3—4 years	24
4—5 years	29
5—6 years	9
6—7 years	23
7—8 years	11
8—9 years	9
9—10 years	8
10—11 years	4
11 + under 13 years	10
Age not given	38

Menstruation is usually the first sign of precocious puberty in the great majority of cases; at first it is irregular; in a minority of cases it is preceded by molimina menstrualia; it recurs regularly every 4—6 weeks and usually lasts from 2—7 days; in a few cases vicarious menstruation from nose was present; in 2 cases epileptic fits occurred at time of regular menstrual time.

Age at which menstruation appeared.	Cases
0—1 year	57
1—2 years	33
2—3 years	23
3—4 years	19
4—5 years	13
5—6 years	10
6—7 years	8
7—8 years	3
8—9 years	2
9—10 years	3
10—11 years	3
11 + under 13 years (age not given)	13

In 9 cases not stated whether present or not.

In 5 cases no menstruation was present.

Of the 57 cases in which menstruation appeared during the first year, the time of appearance was as follows:

	Cases	
At birth	7	Under 6 months, 26 cases.
0—1 month	3	
1—2 months	2	
2—3 months	4	
3—4 months	5	
4—5 months	3	
5—6 months	2	
6—7 months	5	Between 6 months and 12 months, 31 cases.
7—8 months	1	
8—9 months	13	
9—10 months	3	
10—11 months	4	
11—12 months	5	

The age at which first signs of puberty appeared was stated only in very few cases; they were present at birth in 5 cases; between 1-2 years in 2 cases; 2-3 years in 6 cases; 5-6 years in one case; 8-9 years in one case; 9-10 years in one case.

It was formerly thought that precociousness was apt to appear in the later born children of large families; statistics are not very conclusive on this point; as very few authors state either the number of the children in the family or the sequence of birth of the patient.

Number of children in family	*Sequence of patient*
In 3 families—2 children	6 were the 1st born
In 5 families—3 children	4 were the 2nd born
In 3 families—4 children	3 were the 3rd born
In 1 families—5 children	2 were the 4th born
In 5 families—6 children	2 were the 5th born
In 2 families—7 children	1 was the 10th born
In 1 family—11 children	1 was the 15th born
In 1 family—12 children	

Heredity plays but an insignificant part in these cases.

In one case grandmother menstruated at 10 years.

In one case mother menstruated at 17 years, in another case at 10 years.

In one case all sisters (6) had vaginal discharges and enlargement of the breasts.

In one case sister had similar precocity which seemed to be transitory.

In one case sister began to menstruate at 7 years.

The mother of one of these patients had given birth to 11 children before she was 30 years old; another had 7 children in 5 years of married life (one set of twins); 2 mothers menstruated throughout their pregnancies and lactation; one mother had 11 children at 40 years. She was married at 15 years (one set of triplets, 2 sets of twins).

In one case mother had 7 girls and 4 boys. All had milk in breasts at birth and all the girls bloody vaginal discharges.

In one case sister menstruated at 7 years.

The breasts were enlarged in all cases but 4; in a few cases they were massive. In one case, 1½ years old, they were the size of an adult woman; in a 2 year old child they were as big as those of a 16 year old girl; in a 4 year old girl they hung down to the umbilicus. In one case, a 10 year old girl used to offer her breasts to a nursing sister.

The genitals are always enlarged and assume the adult form; in a majority of cases the internal as well as the external organs assume the adult form. The vagina becomes spacious and secretes normal discharge; the uterus and ovaries are large; the ovaries show evidence of follicle formation. In only 5 cases the external genitals were normal.

The secondary sexual characteristics make an early appearance; hair in axilla, on pubis and around the genitals are present in nearly all cases; in 3 cases the hair growth was universal; every part of the body, with the exception of palms and soles, was covered with hair. There was no pubic hair in 6 cases, no axillary in 10 cases; in 10 cases there was marked hair growth over the whole body. Pigmentation of the skin was marked in 3 cases. Other signs of puberty as change of voice, broadening of pelvis, early change of teeth and early dentition are all evident. Heightened physical growth was noted in many at birth; in most cases the increase in height is accompanied by increase in muscular power and adipose tissue (hips and buttocks). On account of the tendency to early closure of epiphyses they never become giants, but on the contrary at age of real puberty they are undersized for age, though previously they may have been too large for their respective ages.

Physical Development:

Age of Patient	*Height Inches*	*Weight Pounds*	*Normal Height Weight*
1 year	30	28	33 in.—27 pounds
1 year 7 months	45		
1 year 8 months	34	23	
2 years	95 cm.		
2 years 6 months	90 cm.		37 in.—32 pounds
2 years 7 months		49	
2 years 10 months	1.07 cm.	19,500 gm.	
2 years 8 months	46		
3 years 6 months	38	38	39 in.—34 pounds
3 years 6 months	98		
3 years	102 cm.	21½ kilos	
3 years 6 months	38	38	
3 years 4 months	102 cm.	23½ kilos	
3 years	33½	37½	
3 years 6 months	110 cm.	22½ kilos	
3 years 4 months	43	64	
4 years 3 months	110 cm.		41½ in.—41 pounds
4 years	112 cm.		
4 years	60	100	
4 years 6 months	108 cm.	21 kilos	
4 years		52	
4 years 2 months	54¾	71	
4 years		59	
4 years 5 months	42½		
4 years 9 months	112 cm.		
4 years 10 months	(bigger than 10 year old sister (Loriot).		

Age of Patient	*Height Inches*	*Weight Pounds*	*Normal Height Weight*
5 years 6 months	60		44 in.—43 pounds
5 years 4 months	43	52½	
5 years 9 months	131 cm.		
5 years 4 months	43	52	
5 years 3 months	40	50½	
6 years	127 cm.	27 kilos	46 in.—47 pounds
6 years	45	54	
6 year	54¾	71	
6½ years	48		
6 years	112 cm.	238 kilos	
6¼ years	127 cm.	25½ kilos	
6 years	114 cm.	22 kilos	
6 years 7 months	121 cm.	27½ kilos	
7 years	51¼	72	48 in.—52 pounds
7 years 9 months	139 cm.	34.7 kilos	
7 years 1 month	130 cm.	29.5 kilos	
7 years	118 cm.		
7 years	80 cm.		
7 years	52	73½	
7 years	51½	72	
8 years	133 cm.		50 in.—60 pounds
8 years	82 cm.		
9 years	120 cm.		
9 years	51 cm.		
9 years	48		
9 years		120	
9½ years	127 cm.		
10 years	48½		52 in.—65 pounds
10 years	55		
10 years		98	
10½ years	136 cm.		
10 years	55	100	
11 years	152 cm.	52.3 kilos	53½ in.—70 pounds
11 years	54		
Case 1			
9 months		28½	
14 months	32½	36	
Case 2			
At birth	23		
9 months	32		
14 months	34		
6 years	45	54	
9 years	48		
10 years	54		
11 years	56		
End of 11 years	56—growth stopped		
Case 3			
4 years		59	
6 years		79	

Age of Patient	*Height Inches*	*Weight Pounds*
Case 4		
8 months		17½
24 months	37	38
28 months	39	41½
Case 5		
7 years	118 cm.	
9 years	120 cm.	
10 years		98
11 years	152 cm.	115
Case 6		
6¼ years	127 cm.	25½ kilos
7 years 1 mmonth	130 cm.	29½ kilos
10½ years	136 cm.	
12 years	136 cm.	49.3 kilos
Case 7		
7¾ years	139 cm.	34.7 kilos
7¾ years (twin sister)	121 cm.	20.0 kilos
Case 8		
At birth	20	
At 4 years	42	
At 7 years	56	
At 10 years	59	
At 12 years	60½	
Case 9		
At 2 years	26	
At 3 years	39	
At 4 years	41	
At 5 years	43	
At 6 years	47	
At 6½ years	49	

In the case of Cooper, patient was bigger than sister 2 years older. Stocker's patient (7¾ years) was bigger than 13 year old sister; Wall's patient (4½ years) was bigger than 6½ year old sister. The appetite in many cases was very voracious.

X-ray studies have been made in 10 cases. In all, premature ossification had been demonstrated. Dentition had been premature in 7 cases. All teeth at one year (1 case); 4 teeth at 4 months; 4 teeth at 14 days; one tooth at 4 months; normal in 6 cases and delayed in 3 cases. Rickets was present in 15 cases.

Libido is usually not present; it was markedly increased in only 3 cases; masturbation was present in 5 cases; it was distinctly stated as not present in 17 cases.

Mentality usually remains childish and corresponds to real age of child.

Mentality was normal in 16 cases.
Mentality was very bright in 16 cases.
Mentality was precocious in 6 cases.
Mentality was very childish in 3 cases.
Mentality was backward in 7 cases.
Mentality was idiotic in 1 case.

The head in many cases was very large, with marked prominence of cerebellar region.

At 3 years	53 cm.	At 4 years	52.5 cm.
At 5 years	20½ cm.	At 3¾ years	22 inches
At 14 years	20½ cm.	At 2 years	20.8 cm.
At 10½ years	22½ cm.	At 5 years	53 cm.
At 6½ years	52 cm.	At 5¾ years	21⅜ cm.
At 6 years	51.8 cm.	At 6 years	21½ cm.
At 7½ years	53 cm.		

Head stated to be very large; no measurements in 11 cases. (In case of White, head was very small).

Course and Duration. Eleven are known to have died before the age of 8 years. The most common causes of death are malignancy, intervening infections, especially tuberculosis, and hemorrhage due to severe menstrual flow.

Two cases are known to have died of carcinoma of uterus at 27 years (Valentin) and 28 years (Bernard), respectively. Von Haller's case lived to be 75 years; she was markedly developed at birth, at 8 years stillbirth, at which age she also stopped to grow; the patient of Descuret had 8 children, aborted twice, married at 27 years, and at 53 was still menstruating. The patient of Ulrich, married at 23 years, had 2 children, and died at 29 years. In 3 cases the symptoms of precocious puberty receded after they had been present for a number of years. In Cabades case, genital hair disappeared and were replaced by soft small hair. In Stommer's case, menses stopped at 8 years and growth also stopped at same time. In case of Diamant, menstruation stopped at 6 years and epileptic attacks occurred. Epilepsy developed in 6 cases. In Tulpin's case, menses ceased and headaches recurred monthly. Bernard's case stopped to menstruate from 9 to 12 years; then recurred irregularly; she was regular from birth to 9 years. The breasts were reduced in size with advent of menstruation in case of Huggins.

PRECOCIOUS PUBERTY IN MALES

Age at Time of Report

0-1 year	3 cases
1-2 years	2 cases
2-3 years	3 cases
3-4 years	11 cases
4-5 years	11 cases
5-6 years	9 cases
6-7 years	6 cases
7-8 years	3 cases
8-9 years	1 case
9-10 years	0 case
10-11 years	4 cases
11 years +	4 cases
Age unknown	4 cases

Age at Onset of First Puberty

0-1 year	8 cases
1-2 years	9 cases
3-4 years	2 cases
4-5 years	2 cases

Number of Children in Family

In 1 family	1 child
In 2 families	3 children
In 1 family	4 children
In 2 families	5 children
In 1 family	6 children
In 1 family	9 children
In 2 families	10 children

Sequence of Patient

One was first born.
Two were second born.
Four were third born.
One was sixth born.
One was ninth born.

Birth Weight

Bidwell	12-14 pounds
Howax	13 pounds
Moreau	16 pounds
Cushig	7 pounds
Durkee	8 pounds
Hudovernig	small at birth
Stone	11½ pounds
Whipman	8 pounds

From above tables it is evident that most of the cases at time of report were under 6 years of age; (a few of these children come from large families); that the patients are usually the result of early pregnancy; that they are at times of more than average weight at birth and that the symptoms of precocious puberty are usually manifest at birth or very soon after.

The genitals are usually overdeveloped and assume adult form and size. The penis was large in all cases. The testicles were large in all but 2 cases. In 2, the testicles, while large, were not enlarged to same extent as penis. In 4 cases, one testicle was larger than the other. There was no foreskin in 4 cases, owing to rapid increase in size of glands. Ejaculations and erections were present in 22 cases; semen with spermatozoa present in it was found in 5 cases, the youngest of which was 4½. Testicles were undescended in one case (Lopez). White, at 3½ years, had emissions of semen and corpus spongiosum urethrae had outgrown corpora cavernosa.

Hirsuties. Pubic hair was present in all cases; axillary hair in 19 cases; mustache and beard in 31 cases; hair over whole body in 11 cases. Stone, at time of birth, was completely covered with hair. Breasts were prominent in case of Lopez, and well developed in case of Jenkins and Duplessis.

Physical development of these children is very marked, in width, height and strength; but on account of premature ossification of centres, they never become giants, but on the contrary at time of real puberty they are undersized. Growth ceased in case of Sauvage at 7 years; Haller, Syears, Moreau, 10 years; Ontrput 12 years. The muscular development is very marked and they resemble athletes in their configuration. Other signs of puberty are usually present, voracious appetite; deepening of voice, certain psychic manifestations, early dentition, early shedding of milk teeth, and presence of comedones and acne on face and body. Bidwell, cut teeth at 4 months; Lopez, all teeth at one year; Burne, cut 3 teeth before age of 3 months, and Knopfelmacher's case at 2½ years had teeth of child at 10 years.

Age	*Height in Inches*	*Weight in Pounds*
2 years 10 months	96 cm.	
1 year 11 months	39.2 cm.	37
2 years 6 months	39	47
2 years	38	
2 years	44½	58
3 years	103 cm.	49½ kilos
3 years 10 months	48	56
3 years 6 months	46	
3 years 10 months	48½	82
3 years 1 month	39	49
3 years	40½	57¼
3 years 6 months	36½	57
3 years 1 month	42¾	
3 years 6 months	44	62
4 years 2 months	46¾	
4 years	52	40
4 years 11 months	40	58
4 years	122 cm.	36 kilos
4 years	43½	59
4 years 6 months	127 cm.	33.6 kilos
4 years	49¼	70
4 years 3 months	46½	54
4 years	128 cm.	80
5 years 2 months	42	53
5 years 6 months	140 cm.	40 kilos
5 years	51½	82½
Case of Campbell at 5 years reached maximum height.		
6 years	50	74
6 years 9 months	125 cm.	44 kilos
6 years	128 cm.	80

6 years	132 cm.	35.8 kilos
6 years	90 cm.	
6 years 7 months	57	
6 years	50	58
6 years 6 months	52½	75
6 years	60	
6 years	60	
7 years	145 cm.	35.2 kilos
8 years	66	95
8 years	112 cm.	72
10 years 6 months	58	120
11 years	53½	
11 years 6 months	151 cm.	85
12 years	63	ceased to grow

Mentality was normal in 15 cases; impaired or deficient in 15 cases (2 imbeciles); precocious in 4 cases. Disposition is described as "headstrong," "mechant," "of terrible temper," very kind, shy and bashful; of vicious temper; very musical.

X-ray studies were made in 12 cases; all showed premature ossification of the wrist centres. Many of these children possessed great physical strength. Case of Lopez (3 years 10 months) could lift 140 pound man; Dawkes' case could throw 17 pound hammer at 6 years, and case of Dupuytren (3½ years) could lift 100 pounds with ease.

Heredity plays no part in these cases; in only one case (Durkeé) the father was similarly affected and at 9 years he reached the maximum growth (same height at 39 years). Two of these children are known to have married (Amaya and Virchow) and to have had children; the former is known to have had 4 children and the latter, 2. In case of Stone, the father presented extreme precocity; first sexual indulgence at 8 years. Machell, father developed early.

The skin may be affected with acne, comedones, brown lines on face (Dean, Gautier, Lopez, Moreau, etc.).

In majority of cases sexual desires are dormant; in a few it was increased. Bidwell, avoids women. Campbell, sexual excitement 2-7 years. Dawosky, onanism. Devon, awakened sexual desire. Cazelles, sought the company of girls with ardor. Jenkins, loves the girls. Hudovering, company of girls disagreeable. Harris, sexual passions of a man, which he indulged to a marked degree. Stone, fond of embracing opposite sex. Smith, company of females has no influence. Whipman, had no knowledge of sexual tendencies.

B.—STUDY OF CASES WITH AUTOPSY REPORTS OR OPERATIVE FINDINGS.

PRECOCIOUS PUBERTY DUE TO TUMORS OF THE OVARY

Of all the cases of precocious puberty reported in females, 23 are known to have had malignant tumors of the ovary.

Age of Patient	*Number of Patients*
1-2 years	1
2-3 years	2
3-4 years	2
4-5 years	4
5-6 years	1
6-7 years	4
7-8 years	4
8-9 years	0
9-10 years	0
10-11 years	3

Age at Which Menstruation First Appeared

Age of Patient	*Number of Patients*
1-2 years	6 cases
2-3 years	1 case
3-4 years	0 case
4-5 years	2 cases
5-6 years	3 cases
6-7 years	1 case
7-8 years	3 cases
8-9 years	1 case
9-10 years	1 case

The breasts were enlarged in 12 cases; flat in 4 cases; not stated in 5 cases. The external and internal genitals were enlarged in all cases. Pubic hair was present in all cases; axillary hair only in 5 cases; beard and mustache only in one case. (Case of Bevern, eyebrows and eyelids heavy; lips and chin like those of a calf.) Menstruation was present in every case.

The physical development was stated only in a few cases (4).

5½ years	4 feet	151 pounds
6 years	121 cm.	23½ kilos
6 years	10 cm. higher than normal	
11 years	147 cm.	

Mentality was normal in one case, deficient in one, and dull in one.

In cases that came to operation the removal of the growth induced mammary diminution, cessation of menstruation and of pubic hair growth. On the whole, there was a reversion to more childish type.

PRECOCIOUS PUBERTY DUE TO HYPERPLASIA OR TO TUMOR OF ADRENALS.

It is well known that the adrenals consist of 2 parts, which although anatomically united in man, are morphologically distinct and are developed from different embryonic formations. The cortex is formed from mesoderm cells of the genital ridge; the medulla is developed from cells which belong to the same neuroblast masses as give rise to the nerve cells of the sympathetic ganglia. In fishes these parts remain separate, forming the interrenal bodies, which represent the cortex of the mammal, and the paired chromaffin bodies which represent the medulla.

Cortical tumors may be sarcomata or hypernephromata. The sarcomata are more frequent in males and are of 2 varieties: those with metastases in the skull, ribs and eyes; and those with metastases in liver without ascites and jaundice. The hypernephromata are the only ones which are associated with sex abnormalities and are usually unilateral. Bilateral hyperplasia of the adrenals is usually characterized by a diminution of female and an increase of the male primary and secondary sexual characteristics, and with an increase of maleness in male patients.

There are 21 cases in which there were tumors of the adrenal (17 females; 4 males).

Age at Time of Report

1-2 years	1 case
2-3 years	2 cases
3-4 years	3 cases
4-5 years	4 cases
5-6 years	3 cases
6-7 years	1 case
7-8 years	4 cases
11 years	3 cases

The onset of precocity was noted in 4 cases at 1-2 years; in 2 at 2-3 years; in 2 at 3-4 years; in one at 5-6 years; in 2 at 9-10 years; and in one at 10-11 years.

In females the external genitals were enlarged in all; the internal in only one case. Menstruation was present in only 2 cases; and the breasts were enlarged only in 2 cases. The clitoris was especially enlarged in 10 cases.

In males, the external genitals were as in adults in 3 cases; in one case not stated; in one case testicles were small and not completely descended.

All these cases but one showed marked growth of pubic hair; all but two had mustache and beard growth; axillary hair was present in 15 cases. In 13 cases hair was present all over the body.

Nutrition and Physical Development.

2 cases were well nourished.

10 cases were obese.

1 case was normal.

8 cases not stated.

Age	*Height in Inches*	*Weight in Pounds*
3 years	35½	
3 years	34½	
4 years 9 months	36	43—10/16
4 years	89 cm.	84
5 years 10 months	32	
5 years 6 months	138 cm.	39 kilos
6 years	35	95
7 years	53	90
11 years	131 cm.	44 kilos—600 gm.
11 years	54	87

Three of the above cases showed marked physical strength.

Mentality—One was precocious.

4 were normal.

5 were dull.

1 was idiot.

The skin was coppery or gypsy-like in 2 cases, and acne was present in 3 cases.

There are only 10 authentic cases of hyperplasia of adrenals associated with hermaphroditism in children. The general characteristics are the same as those of above cited cases. Clinically they present the same picture; pathologically they are quite different. The former are due to tumor, the latter to hyperplasia; the former are fatal, the latter are not. The cases due to tumor are unilateral; those due to hyperplasia are bilateral.

Of the 10 cases, 9 were females and one was male. Three were new-born infants; one was 2 weeks old; one, 2 months old; one, 6 weeks old; one, 2 years old; one, 5 years old; one, 10 years old; one, 12 years old.

In the majority of these cases, the external genitals are of the male type; the clitoris is enlarged; and a prostate is present; the ovaries are normal; and the adrenals are the size of the kidneys; or if normal, adrenal rests are usually present.

(To be continued in January, 1923, issue.)

GOITRE IN CHILDREN.

By Sidney Klein, M.D.

New York.

Goitre, strictly speaking, is thyroid enlargement due to causes not locally demonstrable. It occurs endemically, epidemically, and sporadically. Endemically, it is present in all countries, irrespective of climate or altitude. The Alps, Siberia, Finland, Hudson Bay Region, Great Lakes Basin, South America, India, Africa, England and Scotland. Every country has its foci. In the United States, there are centres in Montana, the Dakotas, Mississippi, in the Rockies. The incidence in New York State is very low, except in the western portion. Cattle, sheep, dogs, goats, and other animals in these districts are similarly afflicted. The incidence, per population, depends on the persistence and severity of the etiological factors. In some localities as many as 60 per cent. of school-children are goitrous. The severity of the district can be judged by the number of cretins born; in some, as high as three per thousand.

Congenital goitre is rare in non-goitrous communities, and when they do occur, they are of goitrous parents, or of those living in goitrous districts. Demme, in Switzerland, found 53 congenital goitres out of a series of 642 cases of 15 years of age or less. They have been described as causing dystocia at birth, and have been operated upon successfully after birth, when symptoms called for interference. Acquired goitre occurs most frequently during school-age, just before and around puberty, the tendency diminishing after the thorough establishment of the latter. Few endemic cases begin in the latter part of the third decade.

Women suffer more frequently than men, the numbers approaching equality in the severer districts.

The Excitant Causes of Goitre. An investigator once referred to 378 writers who offered 42 different theories as to the excitant causes of goitre, most of these having been found untenable. Liability to goitre increases with the length of residence in a goitrous district. When recently developed, it has a tendency to disappear with removal, and almost invariably reappears on return.

The chief theories centre about the soil, water-supply, microbic infection, and organic toxic affection; unhygienic surroundings, lack of public sanitation. Predisposing factors are: history of infection, physiological factors which of themselves involve thyroid activity, as puberty and growth, sexual activity, menstruation, emotional states, continued mental strain. Robert McCarrison, while major in the Indian medical service, traveled in the various strumous districts, observed carefully, experimented in the laboratory and with the goitrous surroundings. He proves that goitre is the result of toxins absorbed from the intestine, these toxins derived from some organism ingested from polluted waters in the involved districts. He produces the disease in man with a definite incubation period. He used boiled water and controls, the latter causing goitre, and not the former. He fed rats with goitrous fecal emulsion, and controlled with rats, fed on pure food and water. The former developed goitres, and the latter were free. Whole goitre districts have been much improved by the introduction of water from non-goitrous regions. Very few today deny the factor of water supply in the production of endemic goitre.

Pathology of the thyroid gland and its function commences with an extreme stage of its normal activity. A clear understanding of the latter is therefore essential. The gland is surrounded by a thin capsule of connective tissue from which extend processes, these branching again and again, dividing the gland into lobes and lobules of varying sizes. Scattered throughout the lobules are a large number of closed vesicles, each enveloped in a fine and highly vascular fibrous elastic covering. The vesicles, the secreting units of the gland, vary in size and shape. They are small in the glands of the new-born and the young, and larger in adults. Their shape is round, oval, or tubular, sometimes having side branches, or several communicating. The vesicle is lined by a single layer of epithelium, from low cuboidal to high columnar in type. The vesicles contain the colloid substance of the gland. In the "resting stage" of secretion, the vesicles are distended with colloid, the epithelium being flattened out. In "active secretion," the epithelium is cuboidal or columnar with little colloid in the vesicles. Intervesicular parenchymal cells, practically similar in structure, form new acini, or vesicles, as needed. In the thyroid of the fetus and new-born, the cellular element is most abundant. With age, the gland becomes more vesicular, and less glandular. When the gland secretes actively, the vessels and capillaries become fuller, the colloid becomes vacuolated, and undergoes absorption. The epithelium heightens, and the cellular protoplasm also takes on secretory activities. Toward the end of the process, the secretion from the cells again accumulates in the vesicles, and with aid of chemical changes, the colloid substance becomes impregnated with iodin. The process is repeated according to bodily needs. The thyroid gland is a storehouse for the iodin-containing colloid, to be distributed as needed. The greatest demand seems to be in event of fright or emotional upset, puberty, menstruation, pregnancy, lactation, and in event of the other supposed etiological factors where, if the demand is too great, we have pathological change.

The most important chemical feature of the thyroid is its iodin content. The latter is intimately related with all normal and pathological activities of the gland. Normally, iodin is present in the gland in amounts varying from 2 to 8.5 milligrams, the amount depending on amount ingested. In localities with goitre endemic, the gland is heavy, and the iodin content comparatively low, actually, however, high (50 to 100 milligrams). It is in these glands that the colloid is abundant, the latter being the form in which the iodin is retained and stored. In localities free from goitre, the gland is light, but the amount of iodin per gland weight, high.

The role that the thyroid plays in the development and life of the animal, is always interrelated with the other internal secretory glands. It is associated: (a) With the development and activity of the *genital glands,* and through them with the progress of mental and physical growth (cretinism). (b) With the *pituitary,* thus influencing skeletal growth. The pituitary seems to compensate for the thyroid in case of impaired activity, for, in cretinism and myxoedema, the pituitary is often two to three times its normal size. (c) With the *adrenals,* in control of the blood circulatory tension, and therefore vascular supply with its factors. (d) With the *thymus* in supply of phosphorous for osseous and neural development. (e) With the *pancreas* in carbohydrate metabolism. This much for a review of the status of the thyroid gland in its average normal activities.

The pathology of the thyroid is all initiated with a state of "active secretion," which gradually merges into a state of hyperactive to abnormally active secretion. The actual point of distinction from normal is difficult to determine. The first stage of change is a general hypervascularization,—the capillaries, venules, and lymph spaces,—with general engorgement of the gland. This goes on with the absorption and disappearance of the colloid. The epithelium becomes high columnar with all signs of hyperactivity. There is increase in cell-growth with budding and plication of the epithelium; therefore, a decrease in the size of the vesicles, with an increase in the number of newly formed acini. With the multiplication of the other structures, there is an increase in the fibrous stroma, plus an accumulation of lymphoid cells. The process is a compensatory one, and, depending on the factors calling for, or producing this hyperacitvity, will the cells break down, die, and be replaced by fibrous tissue, if the cause persists; or, with the cessation of the exciting causes, will the gland remain in the resting colloid state, now a much larger gland, with more numerous and distended acini (colloid goitre). The latter is greater in size, the capsule and stroma are thicker, and there is general epithelial hyperplasia. This is the condition present in endemic goitre, where goitrous influences are intermittent in action (usually in spring months); or, as in cases associated with repeated pregnancies. Nodular, and adenomatous goitres, common in strumous districts, have groups of parenchymatous cells proliferating (more common in cretins). The same pathologic mechanism occurs in the cretin, through the maternal blood. In all stages of hyperplasia, there is a corresponding qualitative secretory deficiency, the quantitative increase not compensating altogether.

The simplest form of goitre is the physiological, adolescent, menstruating, emotional goitre, which is a diffuse thyroid engorgement, and subsides when the physiological activity has ceased to call for thyroid secretion. This goitre is usually a symmetrical, boggy, rarely nodular, state of congestion. With it there may or may not be evidences of what we know as hyperthyroidism. It is, broadly speaking, not an abnormal phenomenon. During growth and adolescence, metabolism is usually at a higher plane, and depending on other exterior influences, the evidences of thyroid activity will be more or less prominent. These goitres usually disappear, but occasionally persist, increase in size with each pregnancy, and rarely go on to true Grave's disease. The child with the endemic goitre, or simple colloid goitre, is described by most observers as being usually of lower grade of health. In a series in our Middle-West, almost all had some chronic infective focus, as tonsils with cheesy concretions of pus, tooth and sinus infections. The child may, however, go about with no abnormal sign or symptom, but the swelling in the neck. The goitre may be symmetrical, usually the right lobe enlarged. Often a local aggregation of parenchymatous cells proliferate, forming a circumscribed mass, or an adenoma, which may become encapsulated, and easily removable. There may occur cell destruction with cyst formation. McCarrison finds no symptoms of disturbed thyroid function, excepting in long standing cases, when hypo signs may set in.

Although many describe premature genital development in these cases, as due to thyroid activity, I have come to the conclusion that the thyroid gland is no factor in the production of premature puberty. If a child menstruates at ten, she may have a prominent thyroid, but the latter only in answer to the demands of the gonads, the hyperactivity of which is caused elsewhere. I have first hand information from Dr. Reuben, who, in his pathological and clinical investigation of precocious puberty (recently read at New York Academy of Medicine, Section on Pediatrics) has not found one case where he could put his finger on the thyroid itself as the etiology. Hypothyroid patients have been described as menstruating prematurely, the menstruation being checked by the administration of thyroid extract, and the point presented that thyroid is inhibitory on gonadal activity, explaining in this way, the amenorrhea of the exophthalmic goitre patient. The reports of the patients are not thoroughly given, and the conclusions are doubtful. The amenorrhea of the hyperthyroid is another process entirely. As a matter of fact, the mechanism of the Grave's diseased gland with its effects are not clearly understood.

Schlesinger, studying school-children in Strassbourg, finds breast-development advanced. He did not take up their menstrual onsets. He describes cardiac involvement in 1-6th of the male, and 1-3rd of the female. By this he means, tachycardia and palpitation, occasional hypertrophy. He finds cardiovascular disturbances more common in the nervous type of child. Occasionally he met symptoms of mild hyperthyroidism, rarely a purely thyro-toxic heart. A good number had a pallor, with a body growth in advance of their age, especially the nervous type. Mentally, they grasped well, especially the nervous type. He also describes scoliosis and myopia with the more active thyroid.

Congenital goitres are seen in goitrous districts. McCarrison found 44 per cent. of all cretins goitrous, while Buford (Chicago, 1915), in our Middle-West, found 90 per cent. of cretins goitrous. A good number of congenital goitres disappear in the course of weeks. If they persist, they give evidences of cretinism. They improve on removal from the goitre district. The goitre here is produced in the same way as in the adult, the causative agents acting through the maternal circulation. These goitres are often adenomatous, and sometimes so large as to endanger the life of the child.

Exophthalmic goitre in children is an infrequent occurrence. In one series of 3,477 cases of Grave's disease, 184 were in children under 15, or 5 per cent.; 84 per cent. of these were female. In a Mayo Clinic series of 1512, there were 5 cases under 10 years of age (0.3 per cent.). There are records of children of 2½ years. A case of congenital exophthalmic goitre has been described. Symptoms and signs are as in the adult, but usually in a milder form. Frank exophthalmos is rare; a staring, unwinking look, may be present, and this not until late. The first signs are usually the tachycardia and mental irritability, followed by the tremor and vasomotor disturbances, with the rest of the picture. In the writing of these pages, I was called to see a girl of 12, complaining of palpitation. Examination was negative but for a pulse of 140, while at rest in bed; no signs of puberty; thyroid gland slightly enlarged. After one week's rest in bed, pulse is 98; no other signs of thyroid or circulatory disease. This child deserves observation in the light of our present discussion, her onset being characteristic of hyperthyroid disease. The etiology of exophthalmic goitre is not known. It is fairly definite however that etiologically it can not be considered in a group with the goitres already discussed. In the latter, it is a question of demand of thyroid secretion from an inefficient gland which strains to accommodate, and therefore hypertrophies. In Grave's disease our gland is an efficient one to start with, well able to cope with physiological demands, but whipped into activity through its cervical sympathetic supply. In the simple goitre, the body needs the thyroid secretions; in exophthalmic goitre, these secretions are thrust upon the body, although not needed, with the well-known symptoms ensuing. Etiologically, then, exophthalmic goitre is really not a disease of the thyroid gland, but a disturbed activity due to pathology elsewhere, in or beyond the sympathetic system.

In the treatment of goitre (not exophthalmic), we act on the basis of its etiology as discussed in the early part of this paper: (1) Relief of demands on the thyroid; (2) Substitution or supplementing of thyroid secretion by feeding the latter. Medical measures apply only to goitres of recent origin, not after fibrosis or degenerative changes. In brief, the measures are: (1.) Removal from goitrous district. (2.) Removal of foci of infection. (3.) Treatment of intestinal tract, if the latter requires it. McCarrison used intestinal antiseptics, as thymol, salol, B. napthol. (4.) Treatment of anemia or chlorosis, if present. (5.) Personal and community hygiene and sanitation (food; water-supply; sewage, etc., etc.) (6.) Iodin: Definite results have been obtained in our Mid-west goitres by Marine and Kimball, who fed all school-children sodium iodide 3 gr. every day for 10 days, twice annually. The summary of their results are as follows:

283—normal—treated—none developed goitre.
996—normal—not treated—259 developed goitre.
428—with small goitres—treated—33½% disappeared.
769—with small goitres—not treated—1.2% disappeared.
Out of 4,415 cases treated ½% gave evidence of iodism.

In exophthalmic goitre or hyperthyroid tendencies, iodin would be contra-indicated. Although suggested here in very small doses, its use would not be justified in the face of our present knowledge of the etiology and pathology of hyperthyroidism (See chapters on iodin and thyroid extract in Basedow's "Materia Medica, Pharmacology, and Therapeutics").

Case 1. M. W., only child, female, age 12 years. Tonsillectomy at 10 months. Menstrual onset at 10½ years—excessive.

First sign of goitre noticed a few months after tonsillectomy. At 10, pubic hair first noted; at 11, hair in axilla; at 12, beard-growth first noted. Hair all over body excepting palms and soles within last 6 months. Breasts markedly enlarged. External and internal genitals as in adult. Hair of head getting gray. Marked acne of body and face. Appetite voracious. Thyroid markedly enlarged. Pulse 120-135. Tremor of hands marked. No exophthalmos. Adrenalin test positive. Development: Height 64¾ inches. Weight 154 pounds. One year ago: Height 62¾ inches. Weight 128 pounds. Mentally, bright.

This child gave her first signs following tonsillectomy. Goitre and hyperthyroidism have both been described following tonsillectomy. Reports are meagre, however. (Tonsillectomies are not receiving the "following-up" they deserve, enucleation with absence of hemorrhage being the maximum observations on most of these operations. Observations on the thyroid as part of routine might bring interesting results.) At 10, this little girl began a course of severe, unusual precocious puberty, showing evidences of marked activity on the part of the gonads, adrenals, and thyroid. All symptoms of Grave's disease but the exophthalmos were present. Her physical and mental development are far beyond the average for her age.

Case 2. A. M., female, age 11½ years, one of 3 children. Born in New York City. Measles, chicken pox, mumps, pertussis, adenitis before age of 4. Tonsillitis 2 to 3 times annually. Frequent colds. Parents, Russian; no history of goitre or goitrous surroundings. Patient's thyroid enlargement noticed at 10½ years; then also axillary hair. Onset of menstruation at 11 years. Blushes easily; nervous when talking to strangers. Not irritable. Appetite fair. Bowels regular. Sleeps well. No excessive perspiration. Physical examination is negative, but for diffuse symmetrical thyroid enlargement. Neck 30½ cm. circumference. Puberty established. Heart: rate 80; no hypertrophy or murmurs. No tremors. No eye-signs. Thick abdominal wall. Height 61⅝ inches; weight 113¼ pounds. Mentality a good average for age.

This is another example of precocious puberty, with a thyroid "straining to accommodate" the pubescent activities, resulting in a diffuse simple goitre, probably containing a larger than normal amount of colloid, with the connective tissue elements increased and thickened. No evidences of hyperthyroidism. In her development, the patient is 7 inches above the average height for her age, and 5 pounds heavier than the average girl of her height.

Case 3. P. S., female, age 11 years. Born in New York City. One of 3 children. Parents born in Hungary, not a goitrous district. Measles, tonsillitis, arthritis, frequent colds; tonsillectomy 4 years ago. Nine months ago, mother noticed rapid development of puberty; no swelling in neck ever noticed. Bowels regular. Appetite good. Sleep O. K. No excessive perspiration. No irritability. On physical examination: eyes, negative; thyroid slightly enlarged; no evident tumor of neck. Heart: rate 78-88; systolic murmur at apex transmitted to axilla; no signs of hypertrophy. Slight fine tremor of extended fingers; also fine tremor of lips and tongue. Adrenalin sensitiveness test slightly positive. Height, 56¼ inches; weight 79½ pounds. 7 months ago: height 53¾ inches; weight 71¾ pounds. Mentally precocious.

This girl was adolescing at the age of 10½ with slight thyroid involvement. Physically and mentally unusually well developed. Signs of organic heart disease, in which the question of a congenital condition is being considered. The fine tremors lead one to look for hyperthyroidism, but the absence of tachycardia with the rest of the picture, makes this a mild, simple pubescent goitre.

Case 4. S. S., female, age 11 years. One of 3 children born in New York City. Parents born in Hungary, no goitres in vicinity. Infantile development normal. Measles. Pneumonia at 4. For last 6 months has noticed fullness in neck. No change in size. No menstruation. No irritability. No excessive perspiration. Bowels regular. Appetite good. Sleep good. Examination reveals large prominent eyes (characteristic of her father). No pathologic eye-signs. Thyroid: symmetrical bilateral enlargement; soft; elastic; no thrills or murmurs; no mechanical symptoms. Neck circumference 29 cm. Heart: rate 82-76; no hypertrophy; soft blowing systolic murmur over base, not transmitted. No tremors. Breasts apparently large, but mostly adiposity; child is slightly obese generally. No pubic or axillary hair. Adrenalin test, positive. Height 54½ inches. Weight 84 pounds. Mentally precocious.

On inspection, the large prominent eyes with the goitre could easily be diagnosed in haste as Grave's disease. On closer analysis, however, the large eyes are hereditary, with no other signs of Grave's disease present. The Goetch adrenalin sensitiveness test was strongly positive, but clinical observation of this child over a period of months never revealed abnormally increased thyroid activity, the diagnosis here being simple goitre of pubescent type. She is ¾ of an inch taller than the average of her age, and 14 pounds heavier. Mentally, beyond her age.

Case 5. R. B., female, age 15 years. One of 3 children, born in New York City. Parents, negative; born in Russia, non-goitrous region. Infantile development normal. Measles, scarlet-fever at 1½ years. Pertussis. Frequent colds. Pubic and axillary hair at 11½ years. Breast development at 12 years. Menstruated at 13. With menstrual onset, became much stouter and heavier. Severe myopia since age of 6. Bowels, appetite and sleep, O. K. Slight irritability and "nervousness." No excessive perspiration. Examination: Well developed girl. Wears prominent eye correction. Diffuse, symmetrical, moderately enlarged thyroid (swelling noted for 2 weeks, parents say). Heart: rate 80-68; negative to other examination. Adrenalin test—negative. Height 65 inches. Weight 117½ pounds. Mentality, average for age.

This girl's severe myopia, goitre, and degree of irritability leads one to suspect hyperthyroidism, but analysis shows a simple, pubescent goitre in a child with abnormally large development for her age.

Case. 6. A. S., female, age 11 years. One of 3 children. Family: negative; no goitres or nervous diseases. Measles. Tonsillectomy at 9. School doctor told parents she had "heart disease" at 10 years. One year later, eyes began to bulge and neck became enlarged. Examination: well-nourished girl. Exophthalmos. Enlarged thyroid. Circumference of neck 28 cm. Heart: rate 140; slightly enlarged; systolic murmur at apex and base. Blood pressure, systolic 140. With onset of puberty, all hyperthyroid symptoms were alleviated. Weight 70 pounds.

Her troubles date back to a tonsillectomy at age of 9, since which time she had never been "right." At 10, her school sent her home with "heart disease" (tachycardia, with systolic murmur over base and apex). That year her eyes began to bulge coincident with thyroid enlargement. Here is a rare finding for a child with hyperthyroidism, exophthalmos, and so early in the course. Heart rate: 140, with systolic blood pressure 140. With the onset of puberty, all signs of Grave's disease receded, the tachycardia, thyroid enlargement, exophthalmos, and tremors. Some exophthalmos of one eye remained. Did the pubescent necessity for thyroid secretions relieve the body of this excess, and in this way remove the symptoms? Will the latter return after full establishment of adulthood? It will be interesting to observe this patient's course. Developmentally, the child was about normal.

Case 7. R. S., female, age 11 years. Born in Russia, non-goitrous region. Infantile development normal. Parents and family, negative. Measles. Scarlet-fever. Frequent colds. Tonsillectomy 1 year ago. Until 3 months ago, nothing noted. Since then, a small swelling in neck, enlarging progressively. For 2 weeks before admission, a "sticking" sensation in throat on swallowing. No disturbance in respiration. Slightly irritable. Flushes easily. No excessive perspiration. Bowels, appetite and sleep, good. Examination: Well nourished; eyes, negative; thyroid, markedly enlarged, diffusely and symmetrically; lateral lobes extend well out and up under cleido-mastoid muscles. Breasts, pubic and axillary hair, fairly developed. Heart negative. Skin, dry. No tremors. Neck 33 cm. Pulse 90-85. Height 55 inches. Weight 78 pounds. Mentally precocious. X-ray reveals no substernal thyroid.

This is a large thyroid, the largest I have seen in a pubescent child, with evidences of mechanical disturbance, although not severe. No signs of hyperthyroid activity. Height, weight, and mentality beyond the average for her age.

Case 8. V. P., female, age 9½ years. One of 3 children. Born in New York City. Normal infantile development. Tonsillectomy 8 months ago, followed by hemmorrhage. Since then has not been very strong. Three days before admission, felt heart beating very fast at times, with pain in precordium. Bowels, appetite, and sleep, O. K. Examination: Poorly nourished child; pale; exophthalmos with lagging of upper lids. Heart: size and sounds, negative; rate 108. Lungs, negative. Thyroid not enlarged. No signs of puberty from hair or breast development. Neurologically, negative. Height 49½ inches. Weight 54¼ pounds. Mentality average for age.

This case also points to tonsillectomy as the onset of her complaints. There is moderate exophthalmos with positive eye signs, without palpable thyroid enlargement. Provisional diagnosis here is Grave's disease. Developmentally, the child is below the average for her age; mentally, quite average.

Case 9. G. P., female, age 17 years. Born in New York City. Married. Normal infantile development. Tonsillitis every winter. Menstruation onset at 13; negative. Enlarged thyroid noticed one year before menstrual onset. Married at 15 years 9 months. Normal pregnancy, and delivery 10 months after marriage. Nursed baby for 13 months. No change in size of thyroid since age of 12. Examination is negative but for enlarged thyroid; right lobe larger than left; isthmus large. Heart, negative. Pulse 62. Eyes, negative. Skin: normally localized perspiration. General development good. Well nourished. Good mentality.

This is a simple goitre of pubescent origin, being in no way influenced by marriage, pregnancy, or lactation. No signs of hyperthyroid activity. Developmentally, and as result of marital activity, appears much older and huskier than her actual age would warrant.

Case 10. A. H., female, age 19 years, 3rd child of six. Born in Germany, non-goitrous district. Family, negative. Infantile development, normal. Measles, only disease in the past. Menstrual onset at 13, always regular and uncomplicated. Swelling in neck noted at 12. No increase in size in last 5 years. No complaints, but constipation. Gets little fresh air and exercise, sitting all day at work. No loss in weight. No irritability. Examination: Eyes, negative. Large, cryptic tonsils. Thyroid: large, diffuse, symmetrical, of equal, soft consistency throughout; no nodules, murmurs, or pulsations. Pulse 82. Blood pressure 108/72. Slight bilateral tremors of extended hands. Abdomen negative.

A colloid goitre, fairly large, of adolescent origin, with no signs of hyperthyroidism. From present appearances, the only indication for interference is the cosmetic element. The girl, but for her constipation, is perfectly well, and of good development.

In all these simple goitres we have no evidence of endemicity. They are stray cases from various parts of Greater New York City, where goitre in children is a relatively infrequent occurrence. Neither do any of them originate from parents either involved, or originating from goitrous communities. All the cases are females; in the strumous centers, we find males almost equally stricken. Etiologically, a history of various infections is a common finding, but not a necessary finding, as in Case 10. Besides, a history of numerous infections is common in a great number of all cases appearing at our clinic. The consistent condition throughout, however, is puberty at its onset, all but one being precocious in varying degrees. There are six symmetrical thyroids, and only one with the right lobe more prominent. No nodular involvement or circumscribed pathology in any. The grade of health in these children is, in no fashion, low. There is one coincident organic heart, and another with a "functional" blow; none show evidences of thyrotoxic circulation. The body growth and development of these children, with the simple goitres, is well in advance of their age; but this can be accounted for by their early puberty, adolescence being associated with such development. Marked myopia was prominent in one instance only.

There are three cases of hyperthyroidism; two, with thyroid enlargement, and one without apparent change in size of the gland. All have exophthalmos in varying degrees. One is relieved by onset of puberty. Case 1, complicated by an unusual type of precocious puberty, is far advanced in physical development. The other two are below the average in this respect. Mentally, these children are not striking, being the average for their age, while the rest of the series reported, are remarkably advanced. Etiologically, attention must again be called to tonsillectomy, all three cases of hyperthyroidism giving this operation as the beginning of their thyroid history.

The simple cases have been receiving continuous small doses of iodin (gr. Sod. Iod.) with periods of rest, and under constant observation. In one case (3), there has been diminution in size of the gland. The others have not responded (treatment carried on from 2 to 6 months). The pronounced enlargements will probably remain, and be treated in early adulthood, if the cosmetic demand arises. The hyperthyroid children have received the conservative medical treatment usually administered in this condition, with general care and attention to symptoms as they appeared.

RHEUMATISM AND ITS MANIFESTATIONS IN CHILDREN UNDER FIVE YEARS.

By Alonzo deG. Smith, M.D.

New York.

Rheumatism is a disease with an ancient history, and protean manifestations. The pages of the Ebers Papyrus, which date back to 1348-1281 B.C., and the writings of Hippocrates mention conditions doubtless closely allied to what we know to-day as rheumatism[1]. Among the predisposing causes, cold, dampness, lack of sunshine, chilling of the body surfaces and late autumn seem to rank first. Osler[2] found a family history of the disease in 25 per cent. of his cases. W. B. Cheadle[3] states that in 30 cases, 23 were hereditary. If those with chorea and erythema are included, 31 out of 33 are found with a family history of the disease.

It is possible that there may be intrauterine infection, for Poynton and Paine[4] report vegetations on the mitral cusps of an infant 2 days old. Errors in diet and faulty metabolism have been given as causes of rheumatism. Prout[5] advanced the theory that the condition was due to lactic acid, with which Richardson[6] and Rauch experimentally produced endocarditic lesions; but their observations have not been confirmed by subsequent workers. Latham[7] and Haig thought uric acid was the offending agent. As to sex, females predominate over males in childhood and adolescence, the period of greatest frequency being 5-15 years. Its manifestations in children under 5 years are relatively rare, but not so infrequent as was thought 30 years ago.

Rauchfuss[8] reported 5 cases out of 15,000 nurslings; Weiderhofer[9], one in 70,000; Koplik[10], one in 7,000; Wachenheim[11], 4, up to 3 years of age in a series of 5,200; Miller[12], in 1889, collected 19 authentic cases under one year. Griffith[13] has seen but one case in nurslings, an infant of 8 months. In 1,027 cases, Still[14] did not find one under 2 years of age, and only 8 cases with rheumatic findings before 3 years. Holt and Howland[15] significantly remark: "We once saw, however, in a nursing infant a typical attack of rheumatic fever."

One attack of rheumatism predisposes to another. Chorea, cardiac disease, tonsillitis, pleuritis, arthritis, torticollis, erythematous skin manifestations, and purpura account for the name "protean."

The question of the exciting causes of rheumatism is still in the realm of dispute. In 1887 Mantle[16] presented the view that it was of infectious origin.

Von Leyden[17] recovered a diplococcus from the endocardium of several cases of rheumatism. Triboulet[18] and Wasserman[19] independently confirmed this finding. Achalme[20] described a large spore-bearing anerobic bacillus as the cause. Fritz Meyer[21] examined the blood and joint fluid of 30 cases and found them negative. From the tonsils of these cases cultures were made and injected into rabbits. A diplococcus was isolated from the inflamed joints in 25 out of 30 cases. With this diplococcus, Meyer produced endocarditis in 21 of 100 rabbits. Rosenow[22] has isolated different strains of displostreptococci and claims for them specificity as to the involvement of the heart, joints or muscles. Poynton and Paine[23] describe a minute diplococcus, 0.5 mm. in diameter, with a tendency to occur in chains. It has great resistance to drying, readily produces formic acid in abundance, and grows in filtered cultures of streptococcus pyogenes (Marmocek's test). This latter has been questioned by Meyer and Aronson. Shaw[24], working with the organisms of Poynton, Walker, and Wasserman, concluded that they were identical. The streptococcus viridans has been repeatedly found in cases of rheumatism. Cecil[25] produced submiliary nodules in rabbits with this organism. Schippers and DeLang[26] reported 2 cases of fatal endocarditis in infants in which the streptococcus viridans was found. Chantemesse[27] et al. describe a small bacillus which they found on the endocardium, pia, and cerebral cortex in a case of articular rheumatism. They call this organism mycobacillus synovialis.

PATHOLOGY.

The most common pathological finding in rheumatism is Aschoff and Tawara's nodules which, microscopically, appear as a central area of homogeneous, necrotic tissue surrounded by a zone of leucoccytic infiltration at the periphery of which is fibrous tissue. Radiating towards this one sees numerous blood vessels of varying size and amount of blood cells and sometimes cocci, depending upon the stage at which they are observed.

The synovial fluid is blood-stained and the membranes hyperemic, with leucoccytic congestion. If we recall the process of inflammation, superimpose this upon the particular structures affected in rheumatism, we will have a picture of its pathology. If the part involved is a tendon placed over a prominent point where constant irritation is to be had, subcutaneous nodules make their appearance.

SYMPTOMATOLOGY.

Cheadle has said that "the various manifestations of rheumatism massed together in .... adults tend to become isolated in the case of children so that the .... phenomena are distributed over years instead of weeks or months, and the history of a rheumatism may be the history of a whole childhood." Herein lies the difficulty of diagnosis in children under five. Poynton and Paine have given us a series of 52 cases of rheumatism in these children, which we have attempted to summarize.

Heart disease is a more common manifestation of the primary attack of rheumatism in children than arthritis, which is the reverse of what occurs in adults. Arthritis presenting pain as the only symptom may be followed by severe endocarditis. Unless a careful routine physical examination is done on every child, many cases of endocarditis, with failure to gain in weight, weakness and paleness as the symptoms for which the child is brought to the doctor, will most certainly be missed. The English have coined the word "carditis" to indicate the scope of the effect of the rheumatic toxin upon the heart. That is, the whole heart is affected. For this reason, and the thinness of the heart walls, dilatation is frequent and ofttimes found early in rheumatism in children.

The mitral valve is usually involved; much less often the aortic. The latter lesion indicates a repeated infection; primary aortic involvement is rare. Pericarditis being painless, is of insidious onset. Not rarely it begins with a sudden increase in the febrile reaction, vomiting, dyspnea and rapid pulse rate. If there be fluid, and particularly in the posterior portion of the sac, pressure on the lungs will give physical signs, indistinguishable from pneumonia. Consideration of the tout ensemble will guide the careful diagnostician to a correct opinion.

The rheumatic infection may be so wide-spread in its involvement of serous membranes that a typical Pick's syndrome will be produced as in Poynton and Paine's Case 35, March 1905, R. W., female, aged 4½ years. Six weeks previously she had had a sore throat followed by multiple arthritis, nodules and carditis. Death occurred in April when, in addition mediastinitis, perihepatitis and perisplenitis were found to be present.

Arthritis is second in point of frequency of rheumatic manifestations in early childhood. These may or may not be typical; usually they are not.

CASE REPORTS.

Case 1. A child, female, age 4 years, complained of pain in the joints of the hands and ankle without swelling, redness or increased temperature in them that I could detect. The fever was 104°. There was a coarse systolic murmur at the mitral area. Anemia and weakness were evident. This child had sustained repeated attacks of tonsillitis. Salicylates and sodium bicarbonate relieved the general condition in 48 hours.

Case 2. D. W., female, age 2 years and 2 months: Was seen by the writer at Vanderbilt Clinic on May 31, 1922. The chief complaint was pain in the extremities, shortness of breath and paleness. The family history was negative. The birth was normal. Weight 9½ pounds. At one year the weight was 19 pounds with the clothes on; present weight, 23 pounds. She walked at 16 months. The child appeared to be well until 2 months ago when she had measles. Since then she has complained of pain in the abdomen, and was not as active as usual, preferring to remain in bed. She had given evidence of pain in the extremities, but there had been no swelling, erythema or petechiae.

Physical Examination showed a child of fair nutrition and definite anemia. The lungs were negative. There were hypernormal pulsations in the neck. The apex beat was felt in the 6th space, 2cm. to left of nipple line, left border 8 cm. to left of the midsternum. Right border 2 cm. At the mitral area was heard a loud, near-continuous murmur transmitted to the base. P 2 was accentuated. Abdomen: liver 4 fingers, spleen 2 fingers below costal margin.

Opinion. Acute infective endocarditis (rheumatic). Another phase of this case should be presented. When we showed the case to Dr. Reuben, the weight at one year, the somewhat delayed walking, and the character of the murmur inclined him to suggest that the child had a congenital murmur as well, upon which the acute rheumatic condition was superimposed. Four or 5 days later the child was seen again. This time with physical signs of cardiac decompensation. She was sent to the Nursery and Child's Hospital but died 7 hours after entrance. We are indebted to that hospital for the following data: The leucocyte count was 19,000 with 67 per cent. polymorphonuclear cells. The urine showed albumin, acetone, pus in clumps, and epithelial cells, but no casts. (pyelitis?)

Autopsy Diagnosis. (1) Chronic endocarditis; (2) Congestion of lungs, heart, liver, spleen and gastrointestinal tract; (3) Fatty degeneration of liver.

There were 250 c.c. of straw-colored fluid in the peritoneal cavity.

Macroscopic Findings. Pericardium. Negative except for 6 c.c. of fluid; heart 70 gms.; apex 6th space; left border in left anterior axilliary line; right ventricle 2½ cm. thick; left ventricle 1½ cm. All orifices admitted the index finger. Right auricle 3 times usual size. Muscle pale and flabby. Numerous pin point hemorrhages over posterior surface of right ventricle. Mitral valve presented pin-point vegetations and thickening; also shortening of valve as of long duration. Tricuspid 2 small vegetations. Aortic and pulmonary valves negative. Endocardium of right auricle, thickened and of a grayish color.

Trachea and bronchi congested. Chain of pea size glands and large gland at bifurcation red, succulent, bleed easily.

Lungs. Both upper lobes contain air and of fairly normal color. Both lower lobes congested. Fifteen to 20 c.c. of fluid in each pleural cavity. Bladder and pancreas negative; gastrointestinal tract congested and edematous. *Spleen.* 43 gms., purplish on section.

Liver. 500 gms., 6 cm. below costal margin, yellow (fat), no fibrosis. *Adrenals,* negative. *Kidneys,* one 47½ gms. congested. Other normal.

Microscopic Findings. Malpighian bodies large; central germ centers form greater part of corpuscle; absence of characteristic, large splenic cells. Pulp cavity full of r.b.c. *Lung* alveolar walls thick; alveoli compressed, small, containing large cells with single nuclei, many stippled with pigment; walls show passive congestion. *Kidney,* congested, otherwise negative. *Liver,* congestion severe; yellow pigment in central vein cords of liver cells, and portal space. Capillaries engorged. Regular arrangement of cords and cells distorted. Slight fibrosis about portal spaces. *Heart.* With Unner-Pappenheim and Hemotoxylin-Eosin stains, Aschoff bodies seen in one section of muscle. Mitral valve shows early vegetations. Hyalin staining fibres on edge of valve. Beneath surface r.c. infiltration (early process) ; no bacteria found.

Case 8 of Poynton's series had in addition to an irregular fever and arthritis, axillary and inguinal adenitis and enlargement of the spleen. It is not stated whether the liver was increased in size also. One might question whether this was not Still's disease or, on the other hand, that that condition and rheumatism are related.

On the part of the nervous system, chorea is the chief condition with which we have to deal. Its incidence in females is greater than that in males. In addition, headache, dizziness, nervousness, convulsions, night-terrors and habit-spasms are common in rheumatic children.

Simple sore throat or tonsillitis commonly ushers in the first stage of rheumatism. It is certain that repeated attacks lead to endocarditis and joint involvement. Why all are not affected alike takes us back again to the question of the seed and the soil.

Vomiting, abdominal cramps, diarrhea and mucus white stools are associated symptoms of rheumatism on the part of the alimentary tract. Upon these alone it would be difficult to make a diagnosis in an infant.

We have said the rheumatic child is given to nervous irritability. It is not surprising then that urinary incontinence is found in them also. This brings to mind the suggestion that perhaps after we have exhausted the usual measures in the treatment of enuresis, exhibition of salicylates might be instituted, though we recall that in chorea that drug is of questionable avail.

Stiff-neck, torticollis and general muscle pains occur in a not inconsiderable number of these cases. In the ages under present consideration, it is hardly to be thought that they are due to fibrositis as seen in later life and adulthood. Sometimes this stiffness of the neck and pain in the abdominal muscles, with colic, have led to the diagnosis of cervical Pott's disease and appendicitis respectively.

Subcutaneous nodules, first given general publicity by Barlow and Werner in 1881, were present in 8 out of the 52 cases referred to. These oval semi-transparent, fibrous bodies are to be found over the olecranon, malleoli, edges of the patella and tendon sheaths. They are quite painless. Ofttimes they are the only outward manifestation of the presence of rheumatism and this may be fully developed endocarditis.

Purpura and erythema are the chief cutaneous expressions of rheumatism. The latter appears in the nodosum, marginatum, circinatum and multiform varieties.

Venous thrombosis, albuminuria and acid-sweats are rare findings:

TABLE 1.

ANALYSIS OF CASES OF POYNTON AND PAINE

Pathological condition	No.
Endocarditis	43
Arthritis	35
Chorea	21
Cardiac dilatation	19
Anemia	17
Sore throat	10
Nodules	8
Pericarditis	8
Weakness	5
Wasting	4

Also: 3 each of pleurisy and dyspnea;
2 each of splenomegaly, acid-sweats, and Pick's syndrome;
1 each of venous thrombosis, adenitis, purpura, night-terrors, albuminuria, erythema, diarrhea, torticollis.

Disease	Males	Females	Incidence of Disease	
Arthritis	15	19	Males	24
Endocarditis	19	21	Females	28
Chorea	10	11		

Typical acute articular rheumatism does occur under 5 years of age. We include 2 cases from the service of Dr. Mark S. Reuben.

Case 3. D. N., female, entered Beth Israel Hospital, July 31, 1922. Chief complaint, fever and pain in joints. F.H. and P.P.H. negative: P.I. malaise and anorexia for past 2 months. In last 2 weeks fever and pain in joints of hands and feet. In last 2 days developed cough and running nose.

Physical Examination. Female child, age 2, white. Nutrition fair; skin anemic, smooth, moist, no eruptions or pigmentations. Head, eyes, nose, ears negative. Pharynx of normal color, no tonsillar enlargement. Neck, glands and spine negative. Lungs showed moist râles on both sides posteriorly and in both axillae.

Heart and pulse of good tension. Rate rapid but equal. No enlargement or murmur. The liver and spleen were not palpable. Extremities—joints of every finger of both hands showed spindle shaped swelling, red and tender, knees and ankles involved also. The reflexes were normal.

Diagnosis. (1) Acute articular rheumatism; (2) Acute bronchitis. Subsequently the child developed a papular eczema. September 2, a systolic murmur was detected in the heart. Four days later the spleen was palpable and a thrill felt over the carotids. A portion of the chart of the febrile reaction is given which is characterized by irregularity. In only one instance was there a definite leucocytosis (14,200); an expression of the poor resistance of the child or severe virulence of the infection. The blood culture was negative; no malarial or typhoid organism found. X-ray of the hands failed to show bone pathology. Culture of the throat did not reveal the Klebs-Loeffler organism. The vaginal smear was negative for gonococci. The feces contained no ova.

Salicylates, Fowler's solution, immobilization of the knees in plaster of Paris and baking have been used in this case. Yet when last seen (110th day of the disease), the child was still confined to bed with joint swelling and pain.

Case 4. A. R., white, 22 months, entered Beth Israel Hospital March 20, 1919, complaining of pain in the hip. Family history: Father has had rheumatism for 12 years. P.P.H.: Pneumonia one year ago; 14 days duration; no exanthemata. Running ear for "long time." P.I.: 4 days again pain and heat in left hip becoming progressively worse.

Physical Examination. Pale child, acutely ill, lying on right side, thighs flexed on abdomen; cries on handling. Head, neck and lungs negative. Heart rapid, regular, no murmurs, no enlargement. Apex, 5th: space mid-clavicular line: chest 48 cm. Abdomen negative.

Extremities: Extreme tenderness and marked swelling, redness of left hip region. Reflexes, negative.

Diagnosis. Acute articular rheumatism.

Subsequent findings:

March 29, 1919—Von Pirquet negative; systolic murmur at apex.

April 1, 1919—Both wrists swollen and painful.

May 29, 1919—Schick test ±

X-ray of hip, negative; lungs negative for tuberculosis. Five radiographs of heart between April 1, 1919, and May 19, 1919, showed increasing enlargement of heart right and left.

Urine repeatedly negative.

The patient was discharged from the Hospital June 1, 1919.

DIFFERENTIAL DIAGNOSIS

Rheumatism Is To Be Differentiated From The Following.

Infantile Scurvy. The history of the dietary errors, spongy, bleeding gums, absence of fever in most cases, spindle shaped swelling over the joints of the lower extremities in a child under 2 years without cardiac disease is most certainly scurvy and not rheumatism.

Syphilis. Familial evidence, x-ray and blood examination will help to rule out syphilis.

Osteomyelitis. As an acute synovitis or epiphysitis has a sudden onset and a rapid course with marked leucocytosis, suppuration and convulsions.

Tuberculosis. Sometimes we get a monarticular rheumatism confined to the hip which might easily be mistaken for a tubercular lesion. Even here the diagnosis may be assured if one considers the history, the presence or absence of an intermittent limp, muscle spasm, limitation of motion in all directions, lengthening or shortening of the extremity, muscular atrophy, night cries, pain along the inner side of the thigh referred to the knee, and finally the x-ray picture.

Gonorrheal Arthritis. Holt has reported 26 cases in children under 3 years. The presence of ophthalmia or a vaginal discharge or the history of such will be of assistance in these cases.

Active Rickets. This will hardly be confused with rheumatism, especially if the usual signs are present. If not, a radiograph will reveal the flaring saucer-shaped epiphysis of rickets.

PROGNOSIS.

The importance of rheumatism lies in its carditic complications and the ills attributed to this. It is not a fatal disease of children. The mortality in the early years is greater in males than females, due perhaps to the predominance of acute articular rheumatism in the former with its early cardiac development, and chorea in the latter. The ultimate mortality is greater in females. This statement is not in agreement with the figures given in the table, in which at all ages there is a slight excess of females over males. It is to be remembered that rheumatism is not a reportable disease, and that the profession is not at one in its interpretation of what cases should be called rheumatic.

CITY OF NEW YORK

NUMBER OF DEATHS FROM RHEUMATISM, AT CERTAIN AGE GROUPS, BY SEX, FOR YEARS 1907 TO 1921 INCLUSIVE*

	Years all ages		Under 5 yrs.		5 to 9 yrs.		10 to 14 yrs.		15 yrs. and over	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
1907	254	265	21	22	25	30	20	26	188	187
1908	207	274	12	21	30	34	14	33	151	186
1909	248	272	16	7	34	31	23	29	175	205
1910	290	337	10	16	27	43	38	35	215	243
1911	274	360	11	11	33	38	20	43	210	269
1912	127	163	10	10	15	26	18	25	84	102
1913	192	191	19	15	29	29	19	36	125	111
1914	173	216	10	15	36	31	20	20	107	150
1915	164	166	10	13	29	29	31	22	94	102
1916	129	195	11	12	28	34	14	24	76	125
1917	148	163	12	15	17	14	21	24	98	110
1918	99	153	6	17	12	16	13	14	68	106
1919	137	165	11	13	23	28	16	27	87	97
1920	119	165	9	9	28	23	13	29	69	104
1921	146	164	14	11	28	15	24	22	80	116
Total	2,707	3,249	182	207	394	421	304	409	1,827	2,213

TREATMENT.

Treatment of rheumatism should be directed along the lines of (1) prophylaxis; (2) control of the fever and pain; (3) lessening of the arthritis; (4) prevention of cardiac disease. The importance of proper clothing, such as flannels, the avoidance of damp surroundings and climate, should be emphasized. Mothers are to be advised of the necessity of tonsillectomy in cases requiring it, and the significance of "growing pains," restlessness, night-terrors and habit spasms. Salicylates ordinarily control both fever and pain. Occasionally resort must be had to codein or morphine. The salicylates must be given in divided massive 24-hour doses as they are converted into inert salicyluric acid soon after absorption. The addition of sodium bicarbonate allays gastric irritation. If not, the drugs can be given by the rectum in a starch enema.

Locally, the joint may be wrapped in cotton, or lambs' wool soaked in lead and opium water, belladonna liniment or rubbed with oil of wintergreen. Ofttimes movement of the joint is so painful that it must be splinted.

---

*Data supplied by courtesy of Dr. Wm. H. Guilfoy, Registrar of Records, New York City.

There is no medication which will surely prevent cardiac involvement. Nevertheless, prompt and prolonged rest in bed is of primary importance. The heart should be examined daily for signs of pericarditis. When present, ice bags, cupping, blisters, leeches and aspiration as indicated, may be used with salutary effect. Salicylates should be exhibited for periods of 5 to 7 days in each month for some time after the attack is over.

Correct diet, Fowler's solution, iron and cod-liver oil are valuable adjuncts in the after-care. Suitable graduated exercises, under competent direction, will do much to strengthen the weakened myocardium.

CONCLUSIONS.

1. The specific etiology of rheumatism is unknown. Postmortem findings of streptococci may represent a terminal infection. The production of lesions experimentally is not constant, nor the agent uniform. The rheumatic joint is usually sterile in contradistinction to the septic joints produced by the common variety of streptococci. The reaction to salicylates in rheumatic and septic cases is, one may say, specific in the former and of no avail in the latter.

2. The pathology of rheumatism is not characteristic.

3. (a) Rheumatism is rare in children under 5 years and almost unknown in those under 2 years. (b) Rheumatism in children up to 5 years, as in later childhood, differs from the adult type of the disease in the greater frequency of carditis and associated syndromata. (c) There are no symptoms of which it may be said they are specially found in rheumatism affecting children under 5 years of age. (d) Rheumatic arthritis in children under 5 years is to be differentiated from such a condition due to scurvy, rickets, syphilis, osteomyelitis, gonorrhea and tuberculosis. (e) As to life, the immediate prognosis of rheumatism in children is favorable. (f) The treatment as given is summarized.

BIBLIOGRAPHY

1. Larrabee, J. A.: Acute Rheumatism of Children, 1879.
2. Osler, W.: Prin. and Pract. of Med., New York, 1915.
3. Cheadle, W. B.: Manifestations of Rheumatism in Children, 1889.
4. Poynton and Paine: Researches in Rheumatism, London, 1913.
5. Prout: Quoted under No. 4.

6. Richardson: Quoted under No. 4.
7. Latham: Quoted under No. 4.
8 and 9. Quoted by Sicard, M. H., Med. Rec., May, 1906.
10. Koplik: N. Y. Med. Jour., XLVIII, 673, (1888).
11. Wachenheim, F. L.: ARCHIVES OF PEDIATRICS, September, 1908.
12. Miller, D. J. M.: ARCHIVES OF PEDIATRICS, September, 1899.
13. Griffith, J. P. C.: Diseases of Children, Phila., 1919.
14. Still: Common Disorders of Children, London, 1921.
15. Holt: Disease of Infancy and Children, New York, 1921.
16. Mantle: Brit. Med. Journal, Vol. 1, 237, (1887).
17. Van Leyden: Deutsch, Med. Wchnschr., 1894, 913.
18. Triboulet: Compt. Rend. de la Soc. Biol., Vol. V, 214, (1889).
19. Wasserman: Berliner klin. Wchnschr., No. 29, 638, (1899).
20. Achalme: Ann. de L'Inst., Pasteur, 1879, 845.
21. Meyer, F.: Ztschr. f. klin. Med., Vol. XLVI, 311, (1902).
22. Rosenow: N. Y. Med. Jour., Feb. 7, 1914.
23. Poynton and Paine: Researches in Rheumatism, London, 1913.
24. Shaw: Jour. Path. and Bact., 1904, 158.
25. Cecil: J. Exper. Med., 24: 739, Dec., 1916.
26. Schippers, J. C., and DeLange, C.: Jahr f. Kinderhlk, 45, 332, 1921.
27. Quoted by Riesman, D.: J. A. M. A., May 21, 1921.

PROPHYLAXIS OF ARTHRITISM IN CHILDREN (Médecine, Paris, August, 1922). Mouriquand says that it is impossible to foretell in what form the arthritic tendency will manifest itself in the child when the parents are inclined to gout or lithiasis, diabetes, or other form of what the French call arthritism. It grows more pronounced in each successive generation, unless the parents practice dietetic restrictions and general hygiene before conception, and the mother during pregnancy, and the child is guided into proper habits of eating and living from the very first and onward, with exceptional stress on outdoor life and exercise. He regards it as especially important to have the child's meals separate from the parents', when the latter are great meat eaters. In families with sluggish livers a preventive course of mineral waters, such as the Vittel waters, is very useful for the children as well as the adults. He adds that many of the newly rich are founding arthritism in themselves and dooming their children to it, as can be seen by the promptness with which they develop obesity. One obese woman who had borne a very large child, actually starved herself at her second pregnancy, but this second child was even larger than the first. He knows of several instances of this, and the women's general health suffered from the inadequate nourishment. However, experiences with animals demonstrate that the diet after conception does have some influence on the nourishment of the fetus as a rule.—*Journal A. M. A.*

CONGENITAL CYANOSIS AND CONGENITAL HEART DISEASE, WITHOUT MURMURS.*

By Mark S. Reuben, M.D., and Walter C. A. Steffen, M.D.

Congenital malformations of the heart have been the subject of many important articles. For a long time cyanosis was so invariably associated with this condition that it was generally referred to as the "blue disease." Then came the discovery of auscultation by Laennec; it then became evident that those patients presented murmurs which varied in intensity, position and propagation.

In 1858, Peacock, described 2 cases of congenital heart disease, in which there were no murmurs to be heard. In 1890, Variot and Gompert reported a case which at autopsy showed a large interventricular defect, a uniform narrowing of the pulmonary artery and an equality in thickness of both ventricles. During life this patient presented no murmurs. Thus it became evident that congenital heart lesions may exist without murmurs.

In due time postmortem studies revealed that not all cases of congenital heart lesions were associated with blueness or cyanosis. In 1878, Franck called attention to the absence of cyanosis in cases of a persistence of ductus arteriosus. In 1879, Roger presented before the Academy of Paris a memoir, which has become epochal.

In a boy, 12 years of age, who had died of a comminuted fracture, he had discovered on autopsy a congenital defect of the heart (open interventricular septum). He thus called attention to a new type of congenital heart lesion not associated with cyanosis.

In 1904, Variot called attention to another type of congenital heart, which is characterized by paroxysmal attacks of marked cyanosis; between attacks, the color of the skin returns to normal or nearly normal; during this stage it is hardly possible to suspect the presence of any cardiac lesion; they are associated with cardiac murmurs in most cases, but not in all. In 2 cases of this type, which came to autopsy, the findings were almost identical. In both cases there were present hypertrophy of the right ventricle, inosculation of the aorta in the right ventricle, narrowing of the muscular portion of infundibulum of pulmonary artery, and communication of the ventricles. During attacks there is marked palpitation of heart with marked increase in frequency; loss of consciousness may be present; slight convulsions and lowering of temperature are frequent accompaniments. These attacks vary in intensity, duration, and in their frequency of recurrence. Between attacks patients may be absolutely normal in all respects except for the presence of a murmur and increased number of red blood cells (6 to 7 million); at times there is a violaceous hue in all distal portions of body and in mucous membranes.

---

*Read before the New York Academy of Medicine, Section on Pediatrics, May, 1921.

In the last ten years the x-ray has proved of distinct value in the interpretation of cardiac conditions; it has especially thrown light on cases of congenital heart lesions without murmurs. The electrocardiogram has but limited value as a diagnostic aid; in two of our cases without murmurs, the electrocardiograms were negative although the x-ray in both and autopsy in one distinctly showed right sided hypertrophy.

The characteristic findings as seen with the aid of the x-ray in the various congenital lesions of the heart are as follows:—(1) Stenosis of pulmonary artery is characterized by hypertrophy of right ventricle and occasionally of right auricle; there is exaggerated prominence of the middle arc on left side, indicating a distention of the pulmonary artery. (2) Interventricular communication. Globular aspect of cardiac shadow, increased size of heart due to enlargement of both right and left ventricles. (3) Stenosis of pulmonary artery with interventricular communication. A combination of above findings is usually present.

Various theories as to causation of congenital heart lesions have been suggested from time to time. Meckel, in 1802, believed them to be due to an arrested development as seen in lower forms of animal life. Others have believed them to be due to fetal endocarditis or developmental defects (especially of interventricular septum (Rokitansky). In last few years Beneke and Spitzer have attempted to explain the origin of congenital heart disease on a purely mechanical basis; the latter especially has developed a mechanical theory based on the effects of blood currents and blood pressure on embryonal heart muscle folds and pads during heart formative period.

The object of this paper is to report 3 cases of congenital heart lesions without murmurs, one with autopsy findings. In a cursory review of the literature we have been able to find about 25 case reports of congenital heart disease without murmurs which had come to autopsy. These have been tabulated (see table) and conclusions drawn from them. Space does not permit the discussion of the reasons of absence of all murmurs in certain cases of congenital heart disease.

REPORT OF AUTHOR'S CASES.*

Case 1. Eunice B.; colored; eleven years at time of first visit; second child; full term; normal labor. Birth weight unknown. Walked at 3 years; talked at 12 months. Physical examination revealed a child that is very much undersize for age. Conjunctivae and mucous membranes cyanosed; eyes bulging, marked dyspnea on slight exertion. Marked emphysema of chest. Liver enlarged. Pulse rapid (120), no murmurs; blood pressure 65 systole; hemoglobin 110; red blood cells, 6,800,000; weight 48½ pounds (68 normal); height 48¼ inches. Chief complaints, dyspnea and cough.

Case 2. Frank B.; 5 years of age; full term; blue baby at birth; had some difficulty in resuscitating child; breast fed for 12 months; sat up at 9 months; first teeth at 6 months; walked at one year; talked at 2 years. Had scarlet fever, frequent attacks of tonsillitis, arthritis, and frequent colds and bronchitis. Since birth the child is always blue; is markedly cyanosed; nutrition fair; mucous membranes cyanosed; tonsils very much enlarged; adenoids present; breathing labored. Chest deformed (pigeon breast), heart action regular but very frequent (132). No murmurs; signs of emphysema. Muscle tone very poor; has not been able to walk for some time; marked clubbing of toes and fingers. Weight 32 pounds; height 40 inches. Blood hemoglobin 110; red blood cells 7,200,000.

Case 3. A. E. This boy was 16 weeks old when first seen. Full term baby; birth normal; breast fed. Blueness was first noticed at birth. The mother believes that the cyanosis is diminishing. The whole body has a violaceous hue. The extremities are markedly cyanosed. The conjunctivae are engorged. Several considerably dilated veins are noticed on the chest wall. At 10 weeks the baby weighed 8 pounds and 15 ounces; at 16 weeks,

---

*These 3 cases are from the Department of Diseases of Children, Vanderbilt Clinic, New York City.

9 pounds and 9 ounces. At irregular intervals the child has attacks during which breathing is labored and the cyanosis becomes more intense. With the exception of an increased precordial impulse the examination of the heart was negative. All cranial sutures were open. The anterior fontanel measured 2½ x 2½ inches. First degree hypospadias was noted. The child died at 11 months shortly after recovering from a mild bronchitis. Death was sudden during an attack of cyanosis. We were only able to obtain the heart for examination. The heart weighed 2 ounces. The aorta was enlarged and its origin was displaced to the right. The place of the pulmonary artery was taken by a very small rudimentary vessel. On section the right auricle was found dilated and considerably larger than the left. The foramen ovale admitted a probe of 0.6 centimeters diameter. The diameter of the muscle of the left ventricle was from 1 to 1.2 cm. The right ventricular muscle measured 0.6 cm. The aorta communicated with both ventricles and was placed directly over the

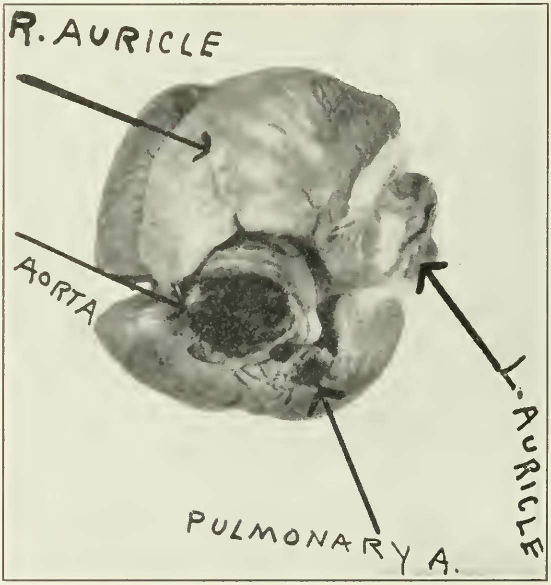


Fig. 1. Right auricle very much dilated. Aorta five times the size of pulmonary artery.

intraventricular septum, which was incomplete in its upper portion. The pulmonary artery was completely closed for about one cm. from its origin.

A study of the autopsy findings in the 25 cases reveals that cyanosis was present in every case from birth.

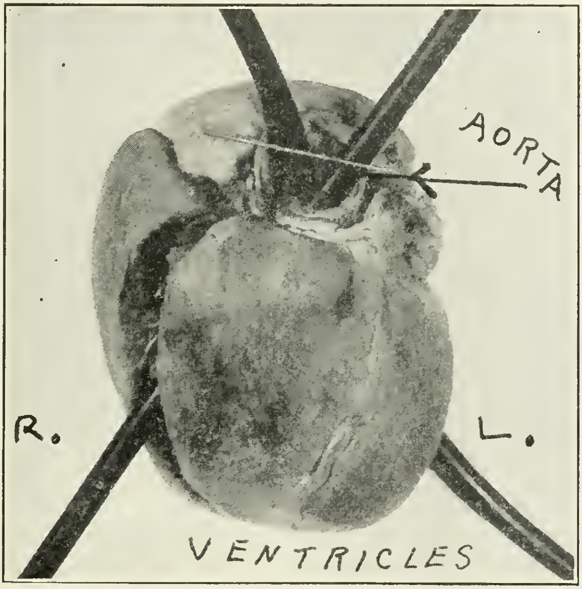


Fig. 2. Two probes introduced through the aorta, making their exit through right and left ventricles.

The most common lesions found were as follows:

Interventricular communication	18 cases
Complete atresia of pulmonary artery	18 cases
Stenosis of pulmonary artery	12 cases
Aorta communicates with both ventricles	9 cases
Patent ductus arteriosus	8 cases
Patent foramen ovale	12 cases
Right ventricular hypertrophy	12 cases
Aorta had its origin in right ventricle	1 case
Transposition of great vessels	2 cases
One auricle and one ventricle	2 cases
Common trunk for aorta and pulmonary artery	1 case
Tricuspid stenosis	1 case

Study of the above data reveals that in any case of congenital cyanosis presenting other symptoms which suggest the presence of congenital heart lesions (enlargement of heart as shown by

ABSTRACT OF CASES, CONGENITAL HEART WITHOUT MURMURS

Author	Age	Sex	Cyanosis	Autopsy Findings							
				Rt. ventricle hypertrophied	Interventricular communication	Atresia pulmonary artery	Narrowing or small pulmonary artery	Aorta	Ductus arteriosus	Foramen Ovale	Other Autopsy Findings
1. Peacock	12m	n.m.	n.m.	Yes	Yes	....	Yes	Communicates with both ventricles	....	......	1.
2. Peacock	6½y	n.m.	Yes	....	Yes	....	Yes	Communicates with both ventricles	....	......	2.
3. Toupet	7y	F	Yes	Yes	....	....	Yes	Communicates with both ventricles	....	......	3.
4. Champetier de Ribes et Carton	1d	n.m.	Yes	....	....	....	....	....	....	......	4. One auricle, one ventricle. Right and left branches of the pulmonary artery arise directly from posterior wall of aorta.
5. Wallach	n.m.	n.m.	n.m.	....	Yes	Yes	....	....	Absent	......	5.
6. H. Ashby	2½y	F	Yes	....	....	....	....	....	Patent	Patent	6. Tricuspid stenosis.
7. H. Leo	9m	F	Yes	....	....	Yes	....	....	Patent	Patent	7. Rudimentary right ventricle.
8. Chiari Schrötter	10m	n.m.	Yes	Yes	Yes	Yes	....	....	Stenosed	......	8. "Rechtslage" of aorta. Perforated auricular septum.
9. Armand Delile	n.m.	n.m.	Yes	Yes	Yes	....	Yes	Communicates with both ventricles	....	......	9.
10. Variot	2½m	M	Yes	Yes	Yes	....	Yes	....	Patent	......	10.
11. Variot et Gompert	5½y	F	Yes	Yes	Yes	....	Yes	Communicates with both ventricles	....	Patent	11.
12. Variot et Devon	15m	M	Yes	Yes	Yes	....	Yes	....	....	......	12.
13. Durante	5m	n.m.	Yes	....	....	....	....	....	Closed	Patent	13. Vena Cava empties into right heart. Pulmonary veins into left. Transposition of vessels.

Author	Age	Sex	Cyanosis	Autopsy Findings R. ventricle hypertrophied	Interventricular communication	Atresia pulmonary artery	Narrowing or small pulmonary artery	Aorta	Ductus arteriosus	Foramen O.a.e	Other Autopsy Findings
14. Grosse	new born	n.m.	Yes	....	....	....	....	Normal	Patent	......	14. One auricle one ventricle. Pulmonary artery normal.
15. Martin	n.m.	n.m.	Yes	....	Yes	....	....	....	Patent	......	15. Right ventricle dilated. Common trunk of aorta and pulmonary artery.
16. Apert	2m	n.m.	Yes	Yes	Yes	....	Yes	Communication with both ventricles	....	......	16.
17. Frenkel	7y	F	Yes	....	....	....	Yes	....	Absence	Patent	17. Right ventricle dilated.
18. Bournier	24d	M	Yes	....	Yes	Yes	....	Arises from R. ventricle	Patent	......	18.
19. Bourlout	3d	n.m.	Yes	....	Yes	Yes	....	....	Patent	Patent	19.
20. Findlay et Martin	n.m.	n.m.	Yes	....	Yes	....	....	....	....	......	20.
21. Ibid	3m	n.m.	Yes	Yes	Yes	....	Yes	Communicates with both ventricles	Patent	Patent	21. Left auricle very small.
22. O. Weber	6y	n.m.	Yes	....	Yes	....	....	....	Closed	Patent	22. Transposition of vessels.
23. Mautner	5M	F	Yes	Yes	Yes	....	Yes	Communicated with both ventricles	Patent at Pulmonary End	Patent	23. Heart apex rounded—both auricles distended.
	14 days	M	Yes	Small Constricted in middle	Septum normal	Complete atresia	....	Normal	Patent	Patent	Auricles very much distended, especially right.
24. Raeder	9 days	..	Yes	Hypertrophied	Yes	Complete atresia	Very Small	Larger than Normal	Patent	Patent	24. Aorta almost straddled septum anomaly of aortic arch and its branches.
25. Reuben & Steffen	11m	M	Yes	Yes	Yes	Yes	....	Communicates with both ventricles	....	Patent	25.

x-ray, dilatation of capillaries of eye, clubbing of fingers, erythrocytosis, high hemoglobin content, osteoarthropathies, increased alveolar Co_2, accentuation of second pulmonary sound, etc.), without the presence of any murmurs, in the majority of cases, we may suspect the presence of pulmonary stenosis or atresia, associated with defect in interventricular septum and patent foramen ovale; very often these lesions are associated with "saddle aorta" and persistent ductus arteriosus. In the great majority of cases the lesions are multiple.

In a future communication it is our purpose to give a detailed account of many congenital heart cases with murmurs which we have followed for from one to 10 years. Sixty to 70 per cent. of these cases do not live to celebrate their first birthday. The three cases here reported have all died at 1, 5 and 14 years respectively. Congenital heart murmurs not infrequently disappear; at times they leave no semblance of previous cardiac deformtiy, at other times they leave all symptoms behind. Any one who has followed a large series of these cases must be impressed with the fact that signs and symptoms very often do not correspond. A child who is the picture of health may have a galaxy of murmurs due to congenital heart lesions; and on the contrary a child with very pronounced symptoms (cyanosis, clubbing, etc.) may have no murmurs.

BIBLIOGRAPHY

1. Peacock: Malformations of the Human Heart, London, p. 100, 1858.
2. Ibid.
3. Toupet: le Progress Medical, 11: 449, 1883.
4. Champetier de Ribes et Carton: Bull. et mem. soc. anat. de Par., 88; 588, 1903.
5. Wallach: Arch. f. Physiol. Heilkunde (Vierordt). 11; 111, 1851.
6. Ashby: Med. Times & Gaz., 1; 353, 1854.
7. Leo: Virchow's Arch. f. path. Anat., Band C3; 503, 1886.
8. Schrötter: Wien. Med. Bl. 11; 20, 1879.
9. Armand-Delile: Bull. et mem. Soc. anat. de Par., 77; 435, 1900.
10. Variot: Bull. et mem. Soc. Med. de hop. de Par., 3S; 20, 196, 199, 1903.
11. Variot et Gompert: Bull. et Mem. Soc. Med. de Hop. de Par. 3S; 7; 186, 1890.
12. Variot et Deve: Bull. et Mem. Soc. Med. de Hop. de Par., 3S; 16, 443, 1899.
13. Durante: Bull. et Mem. Soc. Anat. de Par. 74; 94, 1899.
14. Grosse: Bull. et Mem. Soc. Anat. de Par. 78; 161, 1903.

15* Martin: Bull. et Mem. Soc. Anat. de Par. 1913.
16* Apert: “ “ “ “ “ “ “ 1895.
17* Frenkel: “ “ “ “ “ “ “ 1896.
18* Burneer: “ “ “ “ “ “ “ 1907.
19* Bourlot: “ “ “ “ “ “ “ 1902.

20. Findiay & Martin: Glasgow M. J., 86: 1, 1916.
21. Ibid: Glasgow M. J., 86; 84, 1916.
22. Weber: Monatschr. f. Kinderh., 18; 205, 1920.
23. Mautner: Jahr. f. Kinderh., 96, 1921.
24. Raeder: J. A. M. A., July, 1922.

---

[*] 15-19 incl. quoted from Bertha Campergne Theses, Faculte de Med. de Par. Contributione de l'Etude de la Cyanosis 1912-1913, Vol. X Cam-Cha.

CLINICAL DEPARTMENT

ACUTE MYELOBLASTIC LEUKEMIA*

By S. Horwitt, M.D.
New York.

J. S., male, 5 years, born of healthy, robust parents. Had always been rather above the average in vigor and development. Diphtheria at the age of 2 years, pertussis 1 year ago. Five months ago he suffered from an attack similar to the present, which lasted 3 weeks and ended in recovery. Three weeks ago he was brought to my office for an earache. A routine physical examination disclosed nothing abnormal aside from an (left) acute catarrhal otitis media and a slight elevation of temperature. The child was considered to be suffering from a cold.

On September 13, 1922, he was again brought to see me. The mother complained that for 2 weeks the child had been growing weak and pale, and was getting easily fatigued.

Physical Examination. Marked prostration and pallor. Temperature 101.8°. Skin and mucous membranes show extreme pallor, waxy in type. No ulcerations, no ecchymoses. Moderate cervical and inguinal adenopathy. Subcrepitant râles over both bases. Heart is enlarged to the right and to the left. Blowing systolic murmur over precordium, transmitted in the direction of the left axilla. Spleen and liver are both enlarged and firm, reaching respectively 3 and 2 fingers breadth below the costal margin.

The rapid development of the pallor at first sight suggested acute nephritis. On closer examination, however, it was seen that the pallor, unlike that of acute nephritis, was of a waxy hue, there was no puffiness, and lastly the urine was found practically negative.

In view of the pronounced systolic murmur, the possibility of acute endocarditis, rheumatic or bacterial, was next thought of. In both of these diseases, however, the pallor is slower to develop and its hue is not waxy. In rheumatic endocarditis it is livid gray, the lips are cyanosed, the anemia often gives the impression of being more apparent than real. In bacterial endocarditis, the pallor has the coffee-and-milk tinge. The firm enlargement of both the spleen and the liver likewise seemed to exclude both of these conditions, and particularly the rheumatic form. Also, the bacterial form is usually engrafted upon valves previously diseased (Libman).

---

*Case No. 28.

V. Jacksch's anemia could be excluded as it is a disease of infancy and develops usually on a substratum of debility, malnutrition, rickets, syphilis, etc., none of which conditions existed in this instance.

The most reasonable diagnosis to make was that of some form of grave anemia, probably of the myeloid type. I am indebted to Dr. Jerome Kohn for a blood examination. His report was:

Red Blood Cells	1,000,000
Hemoglobin	20%
White Blood Cells	140,000
Myeloblasts (oxydase positive)	98%
Polynuclears Neutrophiles	2%

Diagnosis. Acute myeloblastic leukemia. The child died 2 weeks later in a state of asthenia and toxemia. His temperature range was pneumonic in type and in fact he developed a terminal pneumonia. Of the noteworthy findings subsequently made were: retinal hemorrhages and a few purpuric spots on the lower extremities.

The important points in this case are: 1. The acute onset of the disease and its fulminating course. If one is to give credibility to the mother's story of a similar attack 5 months prior to the present one, the "cure" during the interval must be interpreted as a remission. Poynton et al. report a remission of many months in a severe case of leukemia[1]. 2. The apparent lack of etiological factors. 3. The type of cell which gives this form of leukemia its name. 4. The presence of a systolic murmur which simulated that of a mitral regurgitant lesion without there being such a lesion (as proved by autopsy.)

Apart from its clinical interest, myeloblastic leukemia occupies an important place in hematological annals. The myeloblast is a white blood cell with a large nucleus and non-granular protoplasm. Formerly it was classed with the lymphocytes and the leukemias in which it figured were considered as of the lymphatic variety. As a result of this belief, all acute leukemias were thought to belong to the lymphatic form, so that the myeloid variety was described as having a chronic form only[2]. Those of us who were reared in their school days on Osler's Principles and Practice of Medicine will remember this classification.

The sharp subdivision of the leukemia into the lymphatic and the myeloid varieties is due to Ehrlich. It was Ehrlich who formulated the dualistic doctrine of the leukemias, according to which the two have a distinct origin, each arising from a pathologic proliferation of a specific tissue. This view was further elaborated to the extent of considering the two processes antagonistic. It was indeed observed that the pathological proliferation of either the lymphoid or of the myeloid elements results in the crowding out and obliteration of the other tissue.

Soon, however, cases were observed in which, although the blood picture suggested the diagnosis of lymphatic leukemia, the subsequent histological study of the affected organs showed hyperplasia of the myeloid tissue. Also, cases were met with in which chronic myeloid leukemia changed toward the end into the acute lymphoid type. These findings were seemingly at variance with Ehrlich's teachings.

However, further study of the myeloid tissue in the state of pathological reaction revealed the presence there side-by-side with the granular myelocytes and polynuclear neutrophiles also various types of non-granular cells. Naegali concluded that the non-granular cells were the parent cells of the other more mature forms. These cells were designated as myeloblasts.[3]

The myeloblast, therefore, although bearing a resemblance to the lymphoid cells, really belongs to the myeloid series. To distinguish these tinctorially a method has been devised which depends on the presence of an oxydase in the protoplasm of most of the members of the myeloid series[4]. Accordingly, acute myeloblastic leukemia is now considered as the acute form of myeloid leukemia.[5] The transition of a myelocitic into a myeloblastic leukemia is merely an indication that the hitherto chronic disease has entered upon an acute course, when less mature cells are discharged into the circulation.

The pathogenesis of acute leukemia, notwithstanding a good deal of research and investigation, has not been definitely cleared up. Some view it as a malignant neoplastic disease, others, as a systematic reaction to infective agents. The fulminating course certainly is suggestive of an acute infection. Cases are on record in which severe infectious diseases were accompanied by leukemia blood pictures and, on the other hand, cases of acute leukemia are known which yielded positive blood cultures. Nevertheless, in many cases the blood cultures are negative, and where they are positive, one must reckon with the possibility of the bacteremia being a complication instead of the primary disease.

Acute leukemia is 5 to 6 times less frequent in childhood than in adult life.[6] It is more common in males than in females. Among the most notable symptoms are severe and extensive hemorrhages and buccal ulcerations. Both of these were lacking in my case. "It is one of the gravest and most fatal diseases in medicine." It may end fatally within two weeks. Recovery is exceedingly rare and all known therapy has proved fruitless.

BIBLIOGRAPHY

1. Poynton, et al.: Severe Blood Diseases in Childhood, Br. J. Dis. Ch., July-Sept., 1922.
2. Herz, Albert: Die Acute Leukemie, Spezielle Pathologie u. Therapie Innerer
3. S. V. Domarus: Die Leukemien, ibid.
4. Rosenthal, N.: Studies on the Oxydase Reaction of the Cells in Normal and in Leukemic Blood, Arch. Int. Med., Aug., 1917, p. 184.
5. MacCallum: A Text Book of Pathology, 1920.
6. Acuna, M.: La Leuiemie Aigü chebles Enfants, Arch, des Med. des Enf., Paris, June, 1906, p. 321.

PSEUDOCYST IN THE RADIUS (Archivo Italiano di Chirurgia, Bologna, May 1922). The head of the radius was resected in the boy of 6, and the findings suggest that some injury of the vessels had allowed the escape of blood into the bone, these repeated small hemorrhages prying apart the lamellae. They drop into the marrow cavity and are absorbed. This sequence may occur from trauma; but more often it is the result of some toxic or developmental anomaly of the artery wall. This explains best the gradual regular increase in the size of the cystic cavity. Scraping out the cyst removes the altered bone tissue and the abnormal vessels and leaves a clean cavity, and there is a chance it will fill up with normal compact bone. These pseudocysts appear during the period of most active growth of the long bones, and in the region of the bone close to the epiphysis, where the growth process is most active. The lesion is usually single and is cured by simple curetting, if the safeguarding of the region can be counted on during the months of the repair process.—*Journal A. M. A.*

CONGENITAL ATRESIA OF THE ESOPHAGUS*

By Walter C. A. Steffen, M.D.

New York.

Cases of congenital malformation of the esophagus, according to some authorities, are extremely rare, yet Brennemann[1], in 1913, reported 3 cases he saw within one year and in 1918[2] he reported 4 others. Most of the men who have reported cases have reported a number. The fact as Brennemann states, "that the patients are just babies and the principal symptom is vomiting, which all babies are supposed to do more or less," would lead one to believe that many cases are not recognized.

Eight types of malformation of the esophagus are described in the literature. The reported case belongs to the group which constitutes 70 per cent. of the cases. //

In order to give a clearer understanding of the probable causation of these malformations, the development of the esophagus and trachea will be briefly reviewed.

"The esophagus and trachea are both derived from the foregut. There is an increase in the vertical diameter of the esophageal tube, giving rise to the pulmonary groove, which grows deeper at the lower end, terminating in a rounded projection. This projection grows out and bifurcates into the right and left bronchi and lung buds. The separation of the lung and trachea from the esophagus proceeds from below upwards."[3] The common origin and development of the respiratory tree and the esophagus explains the trachea-esophageal communication found in some of the malformations.

According to Minot[4] in shark embryos the lumen of the esophagus is entirely obliterated about the time the fourth gill cleft is formed and so remains for a long period.[5] The interdermal canal is for a time in teleost embryos a solid cord. Accordingly we find in them an esophagus without a lumen during certain stages. This obliteration can also be observed in anura just after the larva are hatched and in chick embryos of 1½ days. In lizards the obliteration is incomplete.

According to Broman[6] in a number of the lower vertebrates the esophagus is, in its early development a fibrous cord in its middle portion and only later acquires a lumen. Forssner[7], quoted by Broman, shows reconstruction of the esophagus of a 22.7 mm. human embryo in which, due to proliferation and vacuolization of the epithelium, a very irregular though patent lumen results. It may be readily conceived how this process might abnormally lead to a complete occlusion. Wm. Opitz[8] states that part of the lumen of the esophagus is closed in the human embryo at certain periods and concludes from this that the amniotic fluid cannot be swallowed. Other observers, however, do not substantiate his findings. Maurer[9], in investigations on embryos of birds, finds that, at one period of development, the foregut is patent; becomes obliterated and later acquires a lumen again. Forssner[10] explains atresia of the esophagus with communication with the trachea as an arrest of development. Kreuter[11] reaches the same conclusion after reviewing all the etiological possibilities. Other causes which have been mentioned are: defects in ova and spermatozoa, fetal or maternal trauma, abnormalities of the placenta, hydroamnios and syphilis. The latter causes may, however, be dismissed and the explanation of these malformations found in the arrest and perversion of the development of the esophagus.

---

*Case No. 29.

The clinical picture is fairly definite. The infants are apparently normal at birth. They take the breast or fluid readily. After a minute or two they become cyanosed, stop breathing, and regurgitate. Usually there is a frothy discharge from the nostrils and the inability to swallow the secretions. This may simulate a hydrorrhea. The characteristic regurgitation with suffocative attacks, the inability to pass a tube more than a short distance, usually about 4 inches, should justify one in making a diagnosis. X-ray with bismuth introduced into the esophagus clearly outlines the closure and pouching of the upper end of the esophagus. It might be wise at this point to call attention to the necessity of using care in introducing fluid into the esophagus as the fluid might readily find its way into the lungs through the larynx. Reynolds and Morrison[12] report in one of their cases the flooding of the lungs with contrast salt solution. Brennemann[13] calls attention to the diagnostic value of a distended stomach in ascertaining the presence of a tracheoesophageal communication in these cases. Inanition fever usually sets in about the second or third day. In the reported cases there was no rise in temperature until the evening of the fourth day. Urine is scanty and early suppression is seen. The infants usually have a few small meconium stools. Pneumonia of the right lung is common as a terminal condition. Death, which usually takes place in from 7 days to 2 weeks, is due to inanition, drowning (when persistent attempts are made to feed by mouth, due to the condition not being recognized), or pneumonia.

Surgical treatment has been attempted but in view of the condition with which we are dealing and the present state of surgery of these parts operative interference has nothing to offer.

Case Report. L. O. was an apparently normal female infant at birth. The parents are healthy and the family history is negative except that the father's sister gave birth to a child which had a cleft palate and spina bifida. One other child in the patient's family is alive and well. One still birth occurred 2 years previous to the birth of patient; cause is unknown. There is no history of miscarriages. The child was born at term and weighed 6 pounds, 7 ounces. A few hours after birth a heavy mucus discharge from the nostrils was observed. Water was given from a spoon. The child immediately began to choke and regurgitated all the water given. When put to breast she nursed eagerly. After three or four swallows she stopped breathing, became cyanosed, apparently strangling and in a few moments regurgitated.

On the fourth day, an attempt was made to feed the child by gavage but it was found that the tube could be passed only four inches. Water given by the tube was regurgitated. On the fifth day Dr. M. S. Reuben saw the case. A tentative diagnosis of atresia or diverticulum of the esophagus was made. A roentgenogram taken on the sixth day with bismuth suspension introduced by catheter passed to the point of obstruction, showed the esophagus ending in a blind pouch at the level of the first rib. The catheter was clearly outlined terminating in the pouch. Another plate, taken one-half hour later, showed no further downward movement of the bismuth. A diagnosis of atresia of the esophagus was made. All feeding was stopped. Water was given by rectum. The temperature which was 100° on the fourth day, reached 103° on the seventh day and remained high until death. A dark infiltrated area developed on the left cheek, also small areas of dry gangrene in the tips of the fingers and toes. There were 4 or 5 small meconium stools. Death occurred on the tenth day.

Dr. Reuben and I performed an autopsy 6 hours after death. The body was very much emaciated, weighing 4 pounds 5 ounces, a loss of 2 pounds and 2 ounces since birth. Marked discoloration was noted especially of the face. The left cheek presented a circumscribed dark blue area. The tip of the nose, lower lip, finger tips, toes and buttocks had the appearance of dry gangrene. The thorax showed both lungs distended and congested, the right more so than the left. The upper lobe was consolidated. The heart was normal. The abdomen yielded no findings worthy of note. The intestines were patent throughout, containing scattered masses of meconium. The kidneys showed fetal lobulations. On cut section numerous small concretions were seen in the calices. Genitalia, bladder, uterus and adnexa had a normal gross appearance. The larynx, trachea, esophagus and stomach were removed from the body. A catheter 12 Fr. passed from the stomach into the esophagus appeared in the larynx. Another catheter passed into the upper end of the esophagus stopped in a blind pouch. On dissection this pouch, which apparently was the upper end of the esophagus was found to be posterior to the trachea and measured about one and one-half by one-half inch, slightly dilated at its lower end. From the lower end a fibrous cord passed downward posterior to the trachea and joined the esophagus at the bifurcation of the trachea. The esophagus at this point anastamosed with the trachea. The mucous membrane of the esophagus and trachea was continuous.

The case reported, presenting an atresia of the esophagus with communication of the cardiac end with the trachea, belongs to the largest group of malformations of the esophagus. The explanation can best be found in the comparative anatomy and the development of the esophagus and trachea. The termination of the upper end of the esophagus in a blind pouch 4 inches from the lips, the tracheoesophageal communication, the pneumonia of the right lung are points in common with other cases reported. The clinical findings supported by roentgenogram make the diagnosis comparatively simple.

BIBLIOGRAPHY

1. Brennemann, J.: Am. J. Dis. Child., 5, 143, 1913.
2. Ibid: Am. J. Dis. Child., 16, 143, 1918.
3. Minot, Chas. S.: Human Embryology. New York, 1892, p. 773.
4. Ibid: p. 753.
5. Balfour quoted by Minot, p. 753.
6. Broman, I.: Normal u. ahnormel Entwicklung des Menschen Weisbaden, J. F. Bergmann, 1911, p. 319.
7. Ibid: Hj. Forssner quoted by Broman, p. 320.
8. Opitz, W., quoted by Minot: see reference 3, p. 753.
9. Maurer, F.: Handb. der verleichende u. experimentellen Entwicklungslehre der Wirbeltiere herausg. V. O. Hertwig, Jena, 1906, vol. 1, pt. 2, 166.
10. Hj. Forssner, quoted by Bromann; see reference 6, p. 322.
11. Kreuter, E.: Deutsche Ztschr., f. 79, 1, 1905.
12. Reynolds & Morrison: Am. J. Dis. Child., 21, 339, 1921.
13. See reference 1.

CHRONIC HEMOLYTIC JAUNDICE*

By William V. Levy, M.D.

New York.

There is a large group of cases of which the most prominent features are splenomegaly and anemia. From this group 2 distinct diseases have been segregated which present fairly constant clinical syndromes, namely, Gaucher's disease and hemolytic jaundice. I desire to report an instance of the latter interesting condition.

In 1898 Hayem reported 5 cases of splenomegalic anemia associated with an acholuric jaundice. These cases in which there was a negative family history and in which jaundice first appeared in adult life, were marked by periodical febrile paroxysms during which bile appeared in the urine and the jaundice deepened, these paroxysms being characterized by Widal as "crises of deglobulization." This form of the disease is known as the acquired or Hayem-Widal type.

In 1900 Minkowski reported a similar disease occurring in 3 generations of the same family. He found an increase of urobilin in the urine, and Chauffard in 1907 showed that these cases were distinguished by an increased fragility of the red blood cells and increase of microcytes and of reticulated red cells. The hereditary and familial cases are known as the Minkowski-Chauffard type. With these are also grouped the congenital cases without previous familial occurrence.

The disease may therefore be defined as a condition characterized by increased fragility of the red blood cells, resulting in increased blood destruction and chronic anemia of varying degree, acholuric jaundice and splenomegaly, occurring in congenital, hereditary and acquired forms. Increased fragility of the red cells is considered pathognomonic of this disease. With hypotonic salt solutions, hemolysis of normal red cells begins at 44 per cent. to 48 per cent. and is complete at 30 per cent. In hemolytic jaundice, hemolysis usually begins at 70 per cent. to 60 per cent. and is complete at 40 per cent. to 45 per cent.

The case reported is of the congenital type, with no preceding family involvement, but exhibits many features of the acquired type.

---

*Case No. 30.

M. E., white female, aged 7, is the youngest of 5 children, all the others of whom are living and normal. There is no history of jaundice in any preceding or collateral generation of this family on paternal or maternal side. The mother has had no miscarriages, but during gestation of this child suffered an attack of facial erysipelas. The patient was apparently normal at birth, gestation having been prolonged to the tenth month. She was nursed for over 12 months and made normal progress in growth and development. She had bronchopneumonia at 9 months of age, whooping-cough at 2 years and measles at 4. At 6 she entered school, which she still attends except when incapacitated by the attacks to be described.

Icterus neonatorum appeared on day following birth, became quite intense and then gradually faded. But the jaundice did not entirely disappear and never has during her entire life, her skin having usually a pale waxy lemon tint, the sclerae being more deeply colored. During her first year, at intervals of about a month, she would have attacks of fever and sweats lasting about 3 days, followed by a deepening of the jaundice which would gradually fade to the tint described. These attacks have continued to the present time and although less frequent are becoming more severe as she grows older. They are ushered in with headache and backache followed by fever, cold sweats, pain in the left hypochondrium and sometimes nausea and vomiting, the vomitus being sometimes bile-stained. The fever lasts about 3 days and is always followed by a marked deepening of the jaundice. About 1½ years ago she had a particularly severe attack which confined her to bed for more than a month. The mother was told she had heart and kidney trouble. She was quite yellow but very pale and glossy-looking and hands and feet were puffy. Enlargement of the spleen was noticed during the first year and has steadily progressed.

At present this child is fairly well. She is cheerful, her appetite is good and she attends school regularly. She is well nourished, weighing 50 pounds. The skin is of a pale, translucent, waxy lemon-yellow color. The sclerae are more deeply jaundiced than the skin. Mucous membranes normal. The teeth are in rather poor condition. Bones, joints and superficial lymph nodes normal. Lungs negative. The heart is slightly hypertrophied, the apex beat being in the fifth interspace at the midclavicular line. At times a soft systolic murmur can be heard at the apex. The spleen is greatly enlarged, the lower pole being one inch below the level of the umbilicus, the anterior border being just beyond the middle line. It is smooth, firm, insensitive, with rounded deeply notched anterior border. The liver is moderately enlarged, the free margin being 2 inches below the costal border.

The laboratory findings are as follows: Wassermann negative. Blood count: Red cells 3,000,000; leucocytes 9,000. Polymorphonuclears 53 per cent., small lymphocytes 40 per cent., mast cells 2 per cent., eosinophiles 5 per cent. Hemoglobin 45 per cent. Fragility test: Hemolysis began at .575 per cent. NaC1. and was complete at 45 per cent. Vital staining for reticulation not done. The feces were of dark brown color and normal consistency and contained no parasitic ova. The urine contained no bile.

The etiology of chronic hemolytic jaundice, which is as obscure as the functions of the spleen itself is not discussed in this report. That the causus morbi is elaborated in this organ would appear to be proved by rapid improvement following splenectomy as reported in numerous instances. Mayo reporting 32 cases of chronic hemolytic jaundice in which splenectomy was performed states that there is nothing more remarkable in surgery than the disappearance of the jaundice which the patient may have had all his life, within three or four days after removal of the spleen, and the speed with which recovery from the anemia takes place. Splenectomy has been advised in this case and the patient has just been admitted to hospital for operation. Splenectomy was successfully performed by Dr. John F. Erdmann on October 25, 1922. The patient made an uneventful recovery.

Pathological Report. Gross. Spleen measures 160x75x50 mm. and weighs 253 gm. After formalin fixation it is dark blue in color and presents several shallow furrows. The largest convex surface is marked by irregular yellow patches with white borders. Near these yellow patches there are coarse remnants of adhesions. On section the pulp is mahogany colored throughout with the consistency of rubber. Blood is easily expressed from the cut surface.

Microscopic. Sections of the spleen show a marked increase in endothelial and reticular elements so that the finer framework is thickened throughout. The pulp is everywhere enormously congested and the pulp cells themselves are diminished in number. Malpighian corpuscles appear to be well preserved everywhere and there is only thickening of the trabeculae of the capsule.

Diagnosis. Chronic passive congestion and hyperplasia of the supporting elements of the spleen (hemolytic jaundice, apparently of congenital type).

For pathological report of Dr. W. J. MacNeal we are indebted to Dr. Erdmann.

NOTE

These four papers, especially contributed for this Vanderbilt Clinic Number, have been crowded out because of lack of space:

Precocious Puberty.
By MARK S. REUBEN, M.D., and G. RANDOLPH MANNING, M.D.
(Conclusion)

Effect of Various Diseases on Nutrition.
By HARRY O. ZAMKIN, M.D., and SIDNEY KLEIN, M.D.

Hirschsprung's Disease. A Brief Review of the Literature, with a Report of Six Cases.

By MARK S. REUBEN, M.D., LEWIS M. SILVER, M.D. and WALTER C. A. STEFFEN, M.D.

Congenital Hydronephrosis and Hydroureters. Thorium Intoxication. Autopsy.

By HENRY MARTINSON, M.D., and MARK S. REUBEN, M.D.

They will appear in the next issue.

MEAD'S

Infant Diet Materials

MEAD'S PAGE

A MAN'S name is mentioned and you say, "Yes, I've heard of him."

Later on he is introduced to you, and the next time he is mentioned you remark, "I've met him." In time, you are able to say, "I know him." If you find he wears well you are apt to say, "He's a friend of mine."

Meet

MEAD'S DEXTRI-MALTOSE

The Dextrins and Maltose Carbohydrate for Infant Feeding

MEAD'S CARD

Mead's Infant Diet Materials are advertised only to physicians. No feeding directions accompany trade packages. Information in regard to feeding is supplied to the mother by written instructions from her doctor, who changes the feedings from time to time to meet the nutritional requirements of the growing infant. Literature furnished only to physicians.

Please Write for Samples and Literature.

MEAD JOHNSON & COMPANY
EVANSVILLE, INDIANA

Canadian Factory: Mead Johnson & Co. of Canada, Ltd.
163 Dufferin St., Toronto, Ontario.

London Agents: American Drug Supply Co.
No. 1 Charing Cross, London, S. W. 1.

CHALFONTE-HADDON HALL

ATLANTIC CITY

Combined in Ownership and Management

The beautiful new Boardwalk Wing of Haddon Hall is now open. It connects the original Haddon Hall with the artistic pavilions, restful ocean decks, court garden and sea rooms of the 1920 addition.

On many occasions in the past Chalfonte-Haddon Hall was unable to accommodate all of its many friends

The new Boardwalk Wing now makes possible the hospitable welcome of more than 1200 guests. While "old-fashioned" in its personal attention and service, Chalfonte-Haddon Hall has for more than fifty years kept abreast of the times in its modern facilities for pleasure, comfort and rest.

LEEDS and LIPPINCOTT
COMPANY

On the Beach and the Boardwalk

American Plan. At your service every day of the year.

Attractive Souvenir Folder on Request

MERCUROSAL, 0.1 GRAM
Intravenous
Administration and Dosage
12 TUBES
MERCUROSAL ℞ 2, 0.05 GRAM
INTRAMUSCULAR
READ INSTRUCTIONS PRINTED ON THE INSIDE OF THIS COVER.
PARKE, DAVIS & COMPANY
DETROIT, MICHIGAN, U. S. A.

INTRAVENOUS: Usual dose 0.1 gram, repeated every 2 or 3 days for 10 or 12 doses.
INTRAMUSCULAR: Usual dose 0.05 gram, repeated every 4 or 5 days for 10 or 12 doses.
Courses of Mercurosal injections should be alternated with arsphenamine treatments.

A Dependable Antiluetic

WHEN spirochetes become arsenic-fast—tolerant of arsenic so that, temporarily at least, no further impression can be made on them with Salvarsan or its derivatives—mercury becomes the sheet-anchor of antisyphilitic treatment.

In the short time since our Chemical Research Department developed Mercurosal, trustworthy evidence has accumulated to justify the conviction that this new synthetic compound is a dependable antiluetic, well adapted for administration by the intravenous or by the intramuscular route.

Clinical improvement following Mercurosal injections has been observed to come rapidly. In many cases, too, the sudden disappearance of a seemingly persistent Wassermann reaction has been clearly attributable to the Mercurosal treatment.

Low toxicity. Relatively high content of mercury. Organic combination similar to the combination of arsenic in salvarsan. May be administered intravenously or intramuscularly with a minimum of discomfort to the patient.

Parke, Davis & Company

NEW LITERATURE

Just off the press; gladly sent to physicians on request.

Mercurosal Reprints   Gland Therapy   Booklet on Biological Products

Upon Your Diagnosis Depends Your Success

When you make a correct diagnosis the first-line trench of disease is captured. You should make available for reference and use in your practice all possible information that will help you with your diagnosis.

The Third Edition of Rose's

Physical Diagnosis

is a Helpful Book

By W. D. ROSE, M.D., Lecturer on Physical Diagnosis and Associate Professor of Medicine in the University of Arkansas. Third revised and enlarged edition 755 pages, 6x9, with 319 illustrations in the text and 1 color plate. Price, silk cloth binding, $8.50.

THE BOOK ON DIAGNOSIS THAT CORRELATES THE PRINCIPLES OF PHYSICS, CLINICAL ANATOMY AND CLINICAL PATHOLOGY AND UPON THESE REACHES A CONCLUSION

The two former editions of Rose were very popular with both general practitioner and teacher. The new third edition has been thoroughly revised and brought right up-to-date. The sections dealing with physical examination of the circulatory system and the chapter on blood pressure have been completely rewritten. Polygraphy has been treated with greater detail and the chapter on electrocardiography and diagnosis of cardiac arrhythmias is entirely new. Many new illustrations have been added to the text. Send for a copy.

C. V. MOSBY COMPANY, ***Medical Publishers***

508 North Grand Boulevard ST. LOUIS, MO.

C. V. Mosby Company

Send me a copy of the new 3rd edition of Rose's "Physical Diagnosis." Price, $8.50.

Name ....

....

(Arch. Ped.)

AS A RECONSTRUCTIVE

during convalescence from the acute respiratory infections,

CORD. EXT. OL. MORRHUAE COMP.
(HAGEE)

is an agent of a high degree of service.

Cord. Ext. Ol. Morrhuae Comp. (Hagee) possesses positive hematogenic properties, a feature that makes it of particular value in the run-down state following a protracted illness. Its value in the convalescence from infections of the bronchi and lungs is emphasized by its soothing, corrective influence over inflamed respiratory membranes.

EACH FLUID OUNCE OF HAGEE'S CORDIAL OF THE EXTRACT OF COD LIVER OIL COMPOUND CONTAINS THE EXTRACT OBTAINABLE FROM ONE-THIRD FLUID OUNCE OF COD LIVER OIL, (THE FATTY PORTION BEING ELIMINATED), FOUR GRAINS CALCIUM GLYCEROPHOSPHATE, FOUR GRAINS SODIUM GLYCEROPHOSPHATE, ONE HALF GRAIN SALICYLIC ACID, (MADE FROM OIL WINTERGREEN), WITH GLYCERIN AND AROMATICS.

Easily Assimilated.

Supplied in sixteen ounce bottles only *Dispensed by all druggists.*

Free from Grease and the Taste of Fish.

Katharmon Chemical Co., St. Louis, Mo.

Wanted
Back Numbers
Archives of Pediatrics

We will pay fifty cents per copy for certain back numbers received in good condition.

Write us what you have before sending in journals.

Address
ARCHIVES OF PEDIATRICS
45 East 17th Street New York

ERGOAPIOL (Smith)
For
AMENORRHEA
DYSMENORRHEA
MENORRHAGIA
METRORRHAGIA
ETC.

ERGOAPIOL (Smith) is supplied only in packages containing twenty capsules.

DOSE: One to two capsules three or four times a day.

SAMPLES and LITERATURE SENT ON REQUEST.

MARTIN H. SMITH COMPANY, New York, N.Y.,U.S.A.

Diseases of
Nutrition and Infant Feeding
By JOHN LOVETT MORSE, M.D.
and
FRITZ B. TALBOT, M.D.

Second Revised Edition, Crown 8vo, xii + 384 pages, cloth. Prepaid $3.75

E. B. TREAT & COMPANY
45 East 17th Street New York

Diagnosis of
Nervous Diseases
By SIR JAMES PURVES STEWART

"The book belongs among the few first-class ones on the subject."

Fifth revised and enlarged edition. 8vo, 628 pages, 298 illustrations, from original diagrams and photographs, also colored plates, cloth, prepaid, $10.00.

E. B. TREAT & COMPANY
45 East 17th Street New York

LACTOGEN
The Galactagogue for Nursing Mothers
When their milk is drying up but has not quite ceased, the use of

LACTOGEN

for one week, usually four days, will, in nearly every case, cause an abundant secretion of milk of EXCELLENT QUALITY.

When the quantity of milk is adequate but its nutritive qualities defective, these will be speedily and notably improved by using LACTOGEN.

A full-sized package of LACTOGEN sent free on request to physicians and nurses.

Price, 75 Cents.

LACTOGEN COMPANY
135 Hamilton Place NEW YORK CITY

Sal Hepatica

THE
STANDARD SALINE
LAXATIVE

Samples on request

Bristol-Myers Co.
NEW YORK

ORIGINAL ARTICLES FOR THE PAST TWELVE MONTHS

(*Continued from second page of cover*)

AUGUST, 1922

Prognosis and Treatment of Tuberculosis in Infancy and Childhood, By Rowland G. Freeman, M.D.
The Heart Action in Spasmophilia.......By Henry Koplik, M.D.
The Symptomatology of Structural Abnormalities of the Gastrointestinal Tract in Children.......By Charles G. Kerley, M.D.
Acid Milk in Infant Feeding....By Henry L. K. Shaw, M.D., and Frank Williams, M.D.
Our Changing Attitude Toward the Nutritional Diseases and Disorders, By William Weston, M.D.
Social Service in the Cure and Prevention of Heart Disease.........By A. L. Goodman, M.D.
Rational Management of the Undernourished Child..........By Frank vander Bogert, M.D.

SEPTEMBER, 1922

Rickets in Breast Fed Infants...........By Brown, Courtney, Tisdall, and MacLachlan.
Heart Block in Infancy and Childhood.......By William Rosenson, M.D.
Cholecystitis and Cholelithiasis in Children.......By Charles E. Farr, M.D.
Congenital Hyperplastic Pyloric Stenosis.......By Dudley W. Palmer, M.D.
A Puritan Practitioner.......By Nellis Barnes Foster, M.D.
The Diagnosis of Nasal Sinus Disease in Children.......By H. B. Lemere, M.D.
Immunization Against Measles.......By Charles Herrman, M.D.
Acrodynia (?)—Report of a Fatal Case.......By Clara M. Davis, M.D.
Symptomatology of Pyelitis.......By D. J. Milton Miller, M.D.

OCTOBER, 1922

Acrocephaly.......By Frank W. Young, M.D.
Parenteral Infection in Infants; Its Relation to Digestive and Metabolic Disturbances, By Harry R. Litchfield, M.D., and Leon H. Dembo, M.D.
Acquired Syphilis by Genital Chancre in Male Children, with Report of a Case in a Boy 5½ years......By Mihran B. Parounagian, M.D., and Herman Goodman, M.D.
Observations on the Effect of Complementary Feedings of Dry Milk Powder on the Initial Weight Loss in the New-Born.......By James W. Bruce, M.D.
Persistent Congenital Hypertrophy of the Right Lower Extremity By Sam R. Lustberg, M.D.

NOVEMBER, 1922

Acrodynia and Its Probable Causation......... ...By A. E. Vipond, M.D.
Cerebral Spastic Paralysis, with Special References to Little's Disease, By Daniel L. Golann, M.D.
A Group of Difficult Feeding Cases from the Pediatric Division, City Hospital, By Walter Lester Carr, M.D.
The Diagnosis of Peritonitis and Peritoneal Transudates by Means of Abdominal Puncture with Capillary Tube.......By Bernard S. Denzer, M.D.
Mongolian Idiocy Occurring in One of Twins.......By Homer T. Clay, M.D.
Protein Sensitization, the Common Factor in Whooping-Cough, Asthma, Hay Fever and Influenza.......By J. Francis Ward, M.D.
A Report of 150 Cases of Mongolian Idiocy.............By Frederick H. von Hofe, M.D.
An Easy and Rapid Method of Preparing Protein-Milk............By E. H. Bartley, M.D.

ARCHIVES OF PEDIATRICS

SUBSCRIPTION RATES
Yearly in Advance

Domestic - - - $5.00
Canadian - - - 5.25
Foreign - - - - 5.50

E. B. TREAT & CO., PUBLISHERS
45 East 17th Street, New York

For the enclosed $________________please send Archives of Pediatrics *for one year and continue until ordered stopped. Commence with the______________________issue.*

*Name*______________________________

*Date*________________ *Address*____________________________

RJ
1
A8
v.39

Biological
& Medical
Serials

Archives of pediatrics

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY

STORAGE